



Elmbridge
Borough Council
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Flood Risk Supplementary Planning Document

May 2016

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How to use this Supplementary Planning Document

Flooding from rivers is a natural process that plays an important role in shaping the natural environment. Flooding can also threaten life and cause substantial damage to property. Although flooding cannot be entirely prevented, its impact can be avoided and reduced through good planning and management.

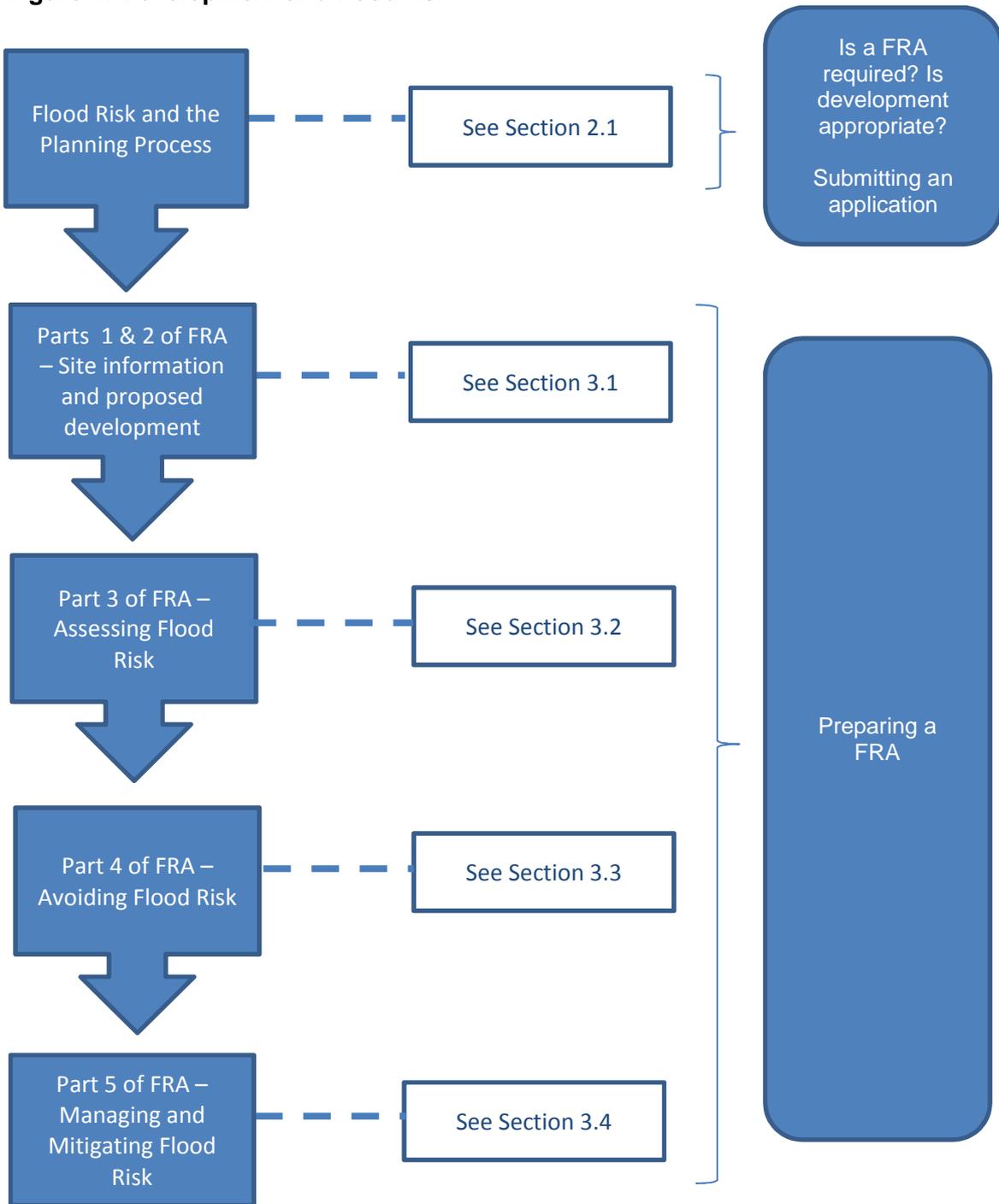
The planning process looks to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk of flooding. Where new development is necessary in high risk areas, it must be made safe without increasing flood risk elsewhere and, where possible, reducing 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.

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 consideration of flood risk is an inherently complex and difficult issue. This Supplementary Planning Document (SPD) has been structured to assist applicants and the public in understanding how the Council will implement planning policies and consider flood risk as part of the planning application process. Part 1 of this document sets out the context and flood risk policies that guide development in Elmbridge. Part 2 provides guidance on identifying flood risk and the planning process, Part 3 of the document is designed to assist applicants in preparing a Flood Risk Assessment (FRA) to accompany a planning application and Figure 1 outlines this process.

Figure 1: Development and flood risk



What are the types of flood risk in Elmbridge?

The main source of flooding in Elmbridge is from rivers, including the Thames, Wey, Mole, Dead River and Rytte. The risk of flooding from rivers is set out in terms of Flood Zones based on the predicted frequency and extent of flooding expected. This is summarised in Table 1 below:

Table 1- Flood Zone Definition for River Flooding

Flood Zone	Flood Zone Definition for River Flooding	Probability of Flooding
Flood Zone 1	Land at less than 1 in 1000 year chance of flooding or 0.1% annual exceedance probability	Low
Flood Zone 2	Land with between 1 in 100 year and 1 in 1000 year chance of flooding or between 1% and 0.1% annual exceedance probability	Medium
Flood Zone 3a	Land with a 1 in 100 year or greater chance of flooding and a greater than 1% annual exceedance probability	High
Flood Zone 3b	Undeveloped land within the 1 in 20 year chance of flooding outline where water has to flow or be stored in times of flood, or land purposely designed to be flooded in an extreme flood event 0.1% annual probability.	Function Floodplain

The Borough is also affected by more localised flooding from surface water, groundwater, existing drainage systems as well as artificial sources e.g. reservoirs.

What are the implications of flood risk for development?

Development is restricted depending on which Flood Zone it is located within and if it is affected by other sources of flooding.

Wherever possible development will be directed away from medium and high flood risk areas. However, where development does take place the Council needs to ensure that it is safe, does not increase the risk of flooding elsewhere and where possible reduces risk overall. This must be demonstrated within a Flood Risk Assessment (FRA).

If the new development is outside of Flood Zone 1, the applicant is required to submit documentation to demonstrate that sequentially preferable sites have been considered. This is the Sequential Test and is, in effect a sieving process designed to ensure that development is steered away from areas at high risk of flooding, where possible. However, when development cannot be located in a lower flood risk area and Exceptions Test many need to be applied and the necessary criteria met. Further details on the Sequential and Exceptions tests can be found in Section 3.3 of the SPD.

For small scale proposals (home extensions, or non-domestic extensions of less 250sqm footprint) if the site is identified in a medium to high flood area the sequential or exceptions tests are not necessary. However, a site-specific Flood Risk Assessment (FRA) will be required to demonstrate that the development is not at risk of flooding and there is no increase in flood risk elsewhere as a result of the development.

What is a Flood Risk Assessment?

A Flood Risk Assessment (FRA) is required for development in areas at risk of flooding. It is carried out to assess the flood risk to and from a development and should accompany planning application. The scale, nature and location of the proposed development will inform the scope of

the FRA that will be required. Section 3 of the SPD provides guidance on what should be included in a FRA.

Where to find information on flood risk?

The Council has produced a Strategic Flood Risk Assessment (SFRA) which brings together various sources of information to provide a comprehensive overview of flood risk in Elmbridge. To find out if a site is at risk of flooding applicants can:

- Check [My Neighbourhood](#) for areas at risk of flooding from rivers
- Check the mapping within the [SFRA](#) for information on flooding from rivers or other types of flooding
- Contact Planning Services at Elmbridge Borough Council via tplan@elmbridge.gov.uk or 01372 474474

More detailed information on the degree of flooding (such as predicted depths and likely hazard) can be obtained from the Environment Agency via enquiries@environment-agency.gov.uk or 03708 506506. Applicants will need to refer to this as a Product 4 request. This information is free for householders but developers will be charged. Other detailed information is also available from the Environment Agency (see Section 3.2 of SPD for more information).

How will this guidance help?

Specifically, the guidance will help applicants to:

- Understand how flood risk is dealt with as part of the planning process.
- Identify the flood risk to a property or site.
- Consider whether the proposed development is appropriate.
- Determine if a FRA is required.
- Access the various pre-application services available.
- Complete the appropriate FRA proforma and prepare a fit for purpose FRA.
- Submit a valid planning application.
- Outline which organisations the Council will consult with.
- Determine if any other consents are required.

Failure to provide a Flood Risk Assessment (FRA) and where appropriate Sequential and Exceptions Tests, are likely to result in delays in the consideration of applications and potential refusal of planning permission

Please note the completion of a FRA will not automatically mean that the development is acceptable in flood risk terms.

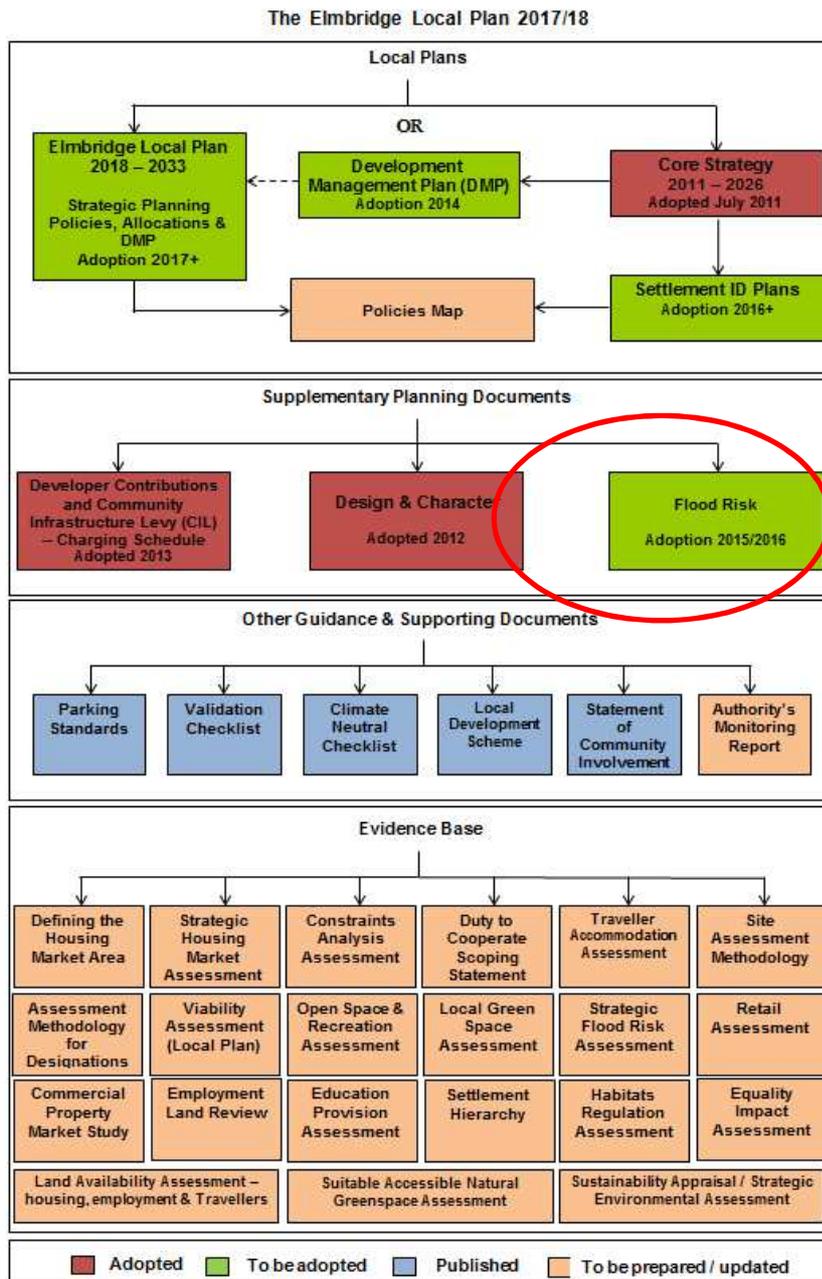
Part 1: Context

1.1 Introduction

Purpose of this guidance

1.1.1 This Supplementary Planning Document (SPD) is intended to support the implementation of policies within the Council's Local Plan in relation to flood risk. It brings together the Council's approach to flood risk set out within the Core Strategy Policy CS26: Flooding, Policies DM6: Landscape and Trees and DM13: Riverside Development Uses of the Development Management Plan, the Design and Character SPD and the Strategic Flood Risk Assessment (SFRA) (June 2015). (Figure 2)

Figure 2: Extract from the Local Development Scheme



1.1.2 The purpose of this document is to give advice and guidance to applicants about the Council's approach to development and flood risk. It is split into three parts. Part 1 covers contextual/background information and Part 2 covers development and flood risk and how this is dealt with through the planning process. Part 3 provides information and guidance to complete a FRA:

Part 1 - Context

- 1.1 - Introduction
- 1.2 - Policy framework and guidance

Part 2 - Development and flood risk

- 2.1 - Flood risk and the planning process

Part 3-Preparing an FRA

- 3.1 - Site information and proposed development
- 3.2 - Assessing flood risk
- 3.3 - Avoiding flood risk
- 3.4 - Managing and mitigating flood risk

The need for this guidance

1.1.3 A significant proportion of the Borough is located within areas at risk of river flooding associated with a number of different watercourses including the Thames, Mole, Dead River, Rythe and Wey. It is also affected by more localised flooding from surface water generated by heavy rainfall, elevated groundwater, existing drainage systems as well as artificial sources including several reservoirs.

1.1.4 The pressure for development is high and it is important that the implications of flood risk are taken into account. This will help to ensure that development is directed away from areas at risk of flooding wherever possible and where it must take place, that it is safe and does not increase flood risk elsewhere. The guidance will support the implementation of policies within the Core Strategy and Development Management Plan. In particular, it will clarify the Council's requirements in terms of when a Flood Risk Assessment (FRA) is required and what information should be included to support decision making.

1.1.5 This SPD has been prepared by Elmbridge Borough Council and builds on the work within the SFRA (prepared by URS (now AECOM)).

Duty to cooperate

1.1.6 There is now a legal duty on local authorities to cooperate with one another, County Councils and other Prescribed Bodies on issues which may have cross boundary implications.

1.1.7 The Council prepared and consulted on a Duty to Cooperate Scoping Statement¹ as part of the background work required to prepare the Elmbridge Local Plan. Flood risk is identified as an issue which may have cross boundary implications and specific engagement activities were proposed and undertaken throughout the preparation of the SFRA.

¹ Duty to Cooperate Scoping Statement - <http://www.elmbridge.gov.uk/planning/policy/dutytooperate.htm>

1.1.8 Given the degree of engagement activities undertaken on the SFRA and that this forms the basis of this SPD, the Council only proposes to engage with those organisations identified in the Scoping Statement on a draft version of the SPD.

Sustainability Appraisal/Strategic Environmental Assessment

1.1.9 This guidance has been subject to a Strategic Environmental Assessment (SEA) and Habitats Regulations² screening process. The Council consulted the relevant statutory environmental bodies on a draft screening report and concluded that an SEA and an Appropriate Assessment are not required.

Status of this guidance

1.1.10 The Flood Risk SPD was adopted by the Council on 3 May 2016. Its adoption means that this document is a material consideration in the planning process. It will be used alongside other policies within the Core Strategy and Development Management Plan to make decision on planning applications for developments in flood risk areas.

Consultation

1.1.11 The document was subject to consultation for four weeks between 12 October and 9 November 2015. The SPD has been developed following internal and external consultation and takes account of many of the comments made. Further details of the consultation arrangements, including the comments made and how these have been addressed in the documents are set in the Regulation 12(a) Consultation Statement.

² In accordance with Regulation 9(1) of the SEA Regulations 2004 and the Conservation of Habitats and Species Regulations 2010

1.2 Policy framework and guidance

Flood Risk Responsibilities

1.2.1 This guidance aims to support the Council and others in fulfilling their flood risk management responsibilities by ensuring that sufficient information is supplied alongside planning applications to support decision making. Table 2 below provides an overview of key organisations and their flood risk management responsibilities.

Table 2 – Flood risk management role and responsibilities

Organisation	Role in relation to flood risk
Elmbridge Borough Council	<ul style="list-style-type: none"> • Preparation of planning documents • Determination of planning applications • Emergency planning
Surrey County Council (Lead Local Flood Authority, Highways Authority)	<ul style="list-style-type: none"> • Required to prepare a flood risk management strategy • Management of flood risk from surface water, groundwater and ordinary watercourses • Responsibility for drainage of surface water from highways • Consenting body for works affecting an Ordinary Watercourse
Environment Agency	<ul style="list-style-type: none"> • Provide technical advice on flood risk to local authorities and developers • Modelling and mapping of flood risk • Consenting body for works affecting a Main River • Management of flood risk from Main Rivers, reservoirs, estuaries and the sea
Thames Water Utilities Ltd	<ul style="list-style-type: none"> • Surface water drainage from development via adopted sewers • Maintaining public sewers
Highways Agency	<ul style="list-style-type: none"> • Drainage of surface water from red routes

National and local policy framework

1.2.2 Table 3 below sets out the main flood risk policy and guidance documents relevant to the planning process in Elmbridge. All local policies and guidance documents are in accordance with national policy contained in the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG).

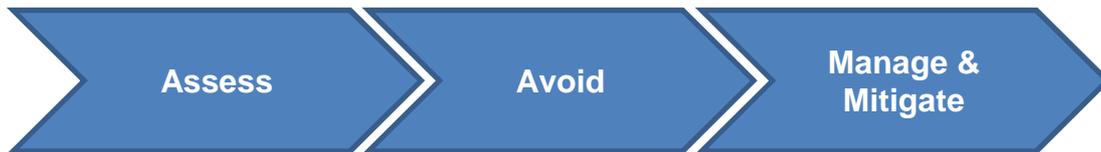
Table 3 – Key planning policy and guidance documents

National Policy/Guidance	
National Planning Policy Framework	https://www.gov.uk/government/publications/national-planning-policy-framework--2
Planning Policy Guidance – Flood Risk and Coastal Change	http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
Environment Agency and Department for Environment, Food and Rural Affairs	https://www.gov.uk/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment

Local policy	
Elmbridge Core Strategy – Policies CS26, CS12	http://www.elmbridge.gov.uk/planning/policy/corestrategydpd.htm
Development Management Plan – Policies DM6 and DM13	http://www.elmbridge.gov.uk/planning/policy/dmp.htm
Local guidance	
Flood Risk Supplementary Planning Document	http://www.elmbridge.gov.uk/planning/policy/frspd.htm
Strategic Flood Risk Assessment	http://www.elmbridge.gov.uk/planning/policy/evidencebase.htm
Design and Character Supplementary Planning Document	http://www.elmbridge.gov.uk/planning/policy/dcspd.htm

National policy and guidance

1.2.3 The approach to considering flood risk is guided by the following broad principles as set out within the NPPF, PPG and advice set out by the Environment Agency and Department for Environment, Food and Rural Affairs (DEFRA):



1.2.4 Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary in areas at risk of flooding all development will need to demonstrate that it:

- Is safe for its lifetime
- Does not increase the risk of flooding elsewhere
- Where possible will reduce flood risk overall.

1.2.5 All such developments will need to meet the requirements of the Sequential and Exceptions Tests (where appropriate) and must incorporate mitigation measures to minimise risk and ensure safety. This should be demonstrated through a site-specific Flood Risk Assessment (FRA).

Core Strategy Policy CS26: Flooding

1.2.6 The Council’s Core Strategy contains the main local policy for addressing flood risk. Whilst it provides local detail, it is in accordance with national policy and follows the key principles of flood risk management discussed above.

Core Strategy Policy CS26: Flooding

In order to reduce the overall and local risk of flooding 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 possible flood risk zone in accordance with PPS25 and the Elmbridge Strategic Flood Risk Assessment.
 - It would not constrain the natural function of the floodplain, either by impeding 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 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 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 risk zones 2 or 3, the Council will require flood resistance and resilience measures in line with current Environment Agency Advice and advice included within the SFRA
4. New development will need to contain SuDS, in line with the Council's Climate Neutral Development Checklist. All development within flood zones 2 and 3 will require surface water run off 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 SFRA, 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 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.

1.2.7 Core Strategy Policy CS12: The River Thames Corridor and its tributaries sets out the Council's coordinated, partnership approach to development adjoining the Borough's river corridors including development design, enhancing the landscape and waterscape, improving public access to the riverside, reducing flood risk and maintaining open areas as potential flood storage.

Development Management Plan Policies

1.2.8 The Core Strategy is supplemented by policies in the Development Management Plan, which provide detail on matters relating to flood risk such as riverside development (Table 4).

Table 4- Development Management Plan policies

Development Management Plan Policy	Summary of policy
DM6: Landscape and trees	Reference to the incorporation of SuDS, predominantly their role in supporting landscape improvements as well as encouraging adaptation to climate change.
DM22: Recreational use of waterways	Consideration of riverside uses that support appropriate recreational activity on waterways. Encouraging public access.
DM13: Riverside development and uses	Design of riverside development including development free buffer strips, landscape, biodiversity, views, public access, heritage and water quality.

Design and Character Supplementary Planning Document

1.2.9 Section 6 (page 53) of the Design and Character SPD sets out details of the design of riverside development.

Elmbridge Strategic Flood Risk Assessment

1.2.10 The Council's SFRA is an evidence base document designed to support the preparation and implementation of planning policies. The current version was published in June 2015.

1.2.11 The SFRA has informed the preparation of this SPD and close reference is made to it throughout. It brings together various sources of information to provide a comprehensive overview of flood risk in Elmbridge. Crucially it contains mapping of flood risk for the Borough as well as summaries of flood risk within each of the Borough's eight Settlement Areas. It is a living document with maps being updated periodically to reflect changes.

Other strategies and guidance

1.2.12 Table 5 highlights a number of key strategies and guidance documents prepared by various agencies that have informed local policies and evidence documents such as the SFRA.

Table 5- Other strategies and guidance

Strategy/Guidance document	Summary	Link
Thames Landscape Strategy	100 year blueprint for the River Thames between Weybridge, Hampton and Kew designed to inform strategic policy.	http://thames-landscape-strategy.org.uk/
Thames Basin – Flood Risk Management Plan	Sets out proposals for managing the risk of flooding at a catchment and river basin scale to inform decisions about where investment and action is targeted.	https://www.gov.uk/government/collect/ions/catchment-flood-management-plans A new draft flood risk management plan has been prepared and consulted on - https://consult.environment-agency.gov.uk/portal/ho/flood/draft_frmp/consult?pointId=s1407245469487

Strategy/Guidance document	Summary	Link
Surrey Preliminary Flood Risk Assessment	A high level summary of significant flood risk.	http://new.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/the-preliminary-flood-risk-assessment
Surrey Local Flood Risk Management Strategy	Provides a clear vision for managing flood risk from surface water, groundwater and ordinary watercourses in Surrey	http://new.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/surrey-local-flood-risk-management-strategy

Part 2: Development and flood risk

2.1 Flood risk and the planning process

Identifying flood risk

2.1.1 In order to determine the likelihood of a development being considered appropriate in flood risk terms and whether a Flood Risk Assessment would be required, applicants must have an understanding of the sources of flood risk that affect a site (Tables 6 and 7). Whilst the main source of flood risk in Elmbridge is from rivers (Table 6) it is also important to consider other sources of flooding e.g. groundwater, surface water etc. (Table 7).

Table 6 – Flood risk from rivers

Sources of flooding	When is a FRA required	Where to look
Flooding from Rivers	Is the site located within Flood Zones 2 or 3a&b? Is the site located within Flood Zone 1 and over 1ha?	SFRA Appendix C & E

Table 7– Flood risk from other sources

Sources of flooding	When is an FRA required	Where to look
Flooding from Land	Is the site affected by surface water flooding e.g. within a High (1 in 30 year) or Medium/Low (1 in 100 year)? and; The site been affected by flooding in the past.	SFRA Appendix D & E
Flooding from Groundwater	Is there potential for groundwater flooding to occur at the surface or to affect properties below ground? Has the site been affected by flooding in the past?	SFRA Appendix B, Figures B2, B3, B5.& Appendix
Flooding from Sewers	Has the site been affected by flooding in the past?	SFRA Appendix E, Appendix B, Figures B7 & B8
Reservoirs, canals and other artificial sources	Is the site at risk of flooding from reservoirs?	SFRA Appendix E Risk of Flooding from Reservoirs mapping (EA website ³).

2.1.2 It should be noted that the Environment Agency and Council mapping can only be displayed at 1:10,000 scale as the modelling of flood zones is only intended to be used at this higher level and it is not intended to provide an accurate risk assessment of individual sites. There is the possibility that a detailed site –specific assessments and modelling may conclude a different level of risk to the mapping within the SFRA and Environment Agency data sets.

2.1.3 The Environment Agency advises that if a developer or landowner is of the view that a particular location is at a different level of risk or that there is information that has not been taken into account, then contact should be made with the local Environment Agency office who will advise on the appropriate procedure and will consider the information accordingly.

³ Risk of Flooding from Reservoirs - <http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=reservoir&scale=1&textonly=off&ep=map&layerGroups=default&lang=e&y=355134&x=357683#x=357683&y=355134&scale=1>

2.1.4 Once the sources of flooding have been considered it is necessary to determine the vulnerability classification of the development. FRAs are required where a change of use to a more vulnerable class is proposed and the site is affected by other sources of flood risk (as outlined in Table 7). The Government has produced a list of vulnerability classifications and these are reproduced in Appendix 1⁴.

Development definitions

2.1.5 The requirements within the SPD vary depending on the type of development proposed and throughout the document distinctions are made between 'all development', 'major development', 'minor development', 'other development' and 'small scale development'. These definitions are set within legislation and national policy and guidance.

What is development?

2.1.6 Planning permission is only needed if the work being carried out meets the statutory definition of 'development' which is set out in Section 55 of the Town and Country Planning Act 1990 (as amended). 'Development' includes:

- building operations (e.g. structural alterations, construction, rebuilding, most demolition);
- material changes of use of land and buildings;
- engineering operations (e.g. groundworks);
- mining operations;
- other operations normally undertaken by a person carrying on a business as a builder.
- subdivision of a building (including any part it) used as a dwellinghouse for use as two or more separate dwellinghouses

2.1.7 **Major development** in planning terms relates to applications that propose;

- 10+ dwellings / over half a hectare
- Office / light industrial - 1000+ m² / 1+ hectare
- General industrial - 1000+ m² / 1+ hectare
- Retail - 1000+ m² / 1+ hectare
- Gypsy/traveller site - 10+ pitches

2.1.8 **Minor development** in planning terms relates to applications that propose:

- 1-9 dwellings / under half a hectare
- Office / light industrial - up to 999 m² / under 1 hectare
- General industrial - up to 999 m² / under 1 Hectare
- Retail - up to 999 m² / under 1 hectare
- Gypsy/traveller site - 0-9 pitches

2.1.9 **Other development** in planning terms relates to the following applications:

- Householder applications
- Change of use (no operational development)
- Adverts
- Listed building extensions / alterations
- Listed building demolition
- Application to demolish an unlisted building within a Conservation Area

⁴ A FRA may also be required where a site is located within Flood Zone 1 but is surrounded by flooding ('dry island').

- Certificates of Lawfulness (191 and 192)
- Notifications

2.1.10 **All development** in relation to flood risk refers to all works requiring planning permission from the Local Planning Authority. However, it is important note that the SPD does make reference to exceptions where the proposed development type does not lead to any impact on flood risk.

2.1.11 **“Small scale development”** in relation to flood risk means:

- minor non-residential extensions: industrial/commercial/leisure etc. extensions with a footprint less than 250 square metres.
- alterations: development that does not increase the size of buildings e.g. alterations to external appearance.
- householder development: For example; extensions to the existing dwelling, sheds, garages, games rooms etc. within the curtilage of the existing dwelling. Specifically, this definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling and as well as the subdivision of houses into flats.

2.1.12 Development does not in all instances require a planning application to be made for permission to carry out the development. In some cases development will be permitted under national **Permitted Development** rights. They derive from a general planning permission granted not by the local authority but by Parliament. This can include extensions and alterations to a dwelling. In particular permitted development for householders does not take account of flood risk.

Is development appropriate?

2.1.13 Where a site is affected by flooding from Rivers there are strict controls on the types of development that are appropriate within different Flood Zones depending on the vulnerability classification (Appendix 1). Prior to preparing a Flood Risk Assessment (FRA) applicants are encouraged to consider whether or not the proposed development is likely to be appropriate in the location (Table 8). In areas shown to be affected by climate change will be treated as Flood Zone 3a for the purposes of flood management and mitigation. The approach on climate change must be in accordance with the most recent guidance issued by the Environment Agency. Further details can be found within Part 3 of the SPD (paragraphs 3.2.13 & 3.2.14).

2.1.14 If the development type is not appropriate it is unlikely that it would be permitted and, therefore, applicants should consider carefully whether or not to proceed with an application.

2.1.15 If development is appropriate then applicants should proceed to undertake Sequential and Exceptions testing (refer to Sections 2.1.16 & 3.3) of the site where appropriate and prepare a FRA to accompany their planning application. The remaining part of Section 2 provides an introduction to FRAs with Section 3 providing detailed guidance on the preparation of a FRA.

Table 8- Development types and appropriate uses (builds on guidance within the PPG)

Flood Zone 3b (1 in 20 (5%) annual probability flood outline)	<p>Undeveloped land (Functional Floodplain), where water has to flow or be stored in times of flood, should be protected from any new development.</p> <p>Only Essential Infrastructure or Water Compatible development will be permitted. Essential infrastructure in this Zone should pass the Exception Test.</p> <p>Basements not permitted.</p>
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Flood Zone 3b (1 in 20 (5%) annual probability flood outline)	<p>Developed land relates solely to existing buildings that are impermeable to flood water.</p> <p>Some small scale or <u>re</u>-development proposals may be considered⁵.</p> <p>Change of use to a higher vulnerability classification is not permitted. Basements, basement extensions, conversions of basements to a higher vulnerability classification or self-contained units are not permitted.</p>
Flood Zone 3a (High Probability)	<p>The water-compatible and less vulnerable uses of land are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.</p> <p>The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exceptions Test is passed.</p> <p>Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted. All other basements, basement extensions and basement conversions may be considered. Regard will be had to whether the site is also affected by groundwater flooding.</p>
Flood Zone 2 (Medium Probability)	<p>Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses as set out in Appendix 1, are appropriate in this zone.</p> <p>Highly vulnerable uses are only appropriate in this Zone if the Exception Test is Passed.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted. All other basements, basement extensions and basement conversions may be considered. Regard will be had to whether the site is also affected by groundwater flooding.</p>
Flood Zone 1 (Low Probability)	<p>Generally all land uses of land are appropriate. Areas in Flood Zone 1 surrounded by flood water ('dry islands') will need to have regard to the Flood Zone surrounding the site and may require an FRA Further information on 'dry island' can be found in Section 3.2.</p>

Development Management Sequential and Exceptions Test

2.1.16 Wherever possible development will be directed away from medium and high flood risk areas. However, where development does take place the Council needs to ensure that it is safe, does not increase the risk of flooding elsewhere and where possible reduces risk overall. This must be demonstrated within a Flood Risk Assessment (FRA)

2.1.17 If the new development is outside of Flood Zone 1, the applicant is required to submit documentation to demonstrate that sequentially preferable sites have been considered. The NPPF, Planning Practice Guide provides the basis for the Sequential Approach.

2.1.18 The Sequential Test is, in effect a sieving process designed to ensure that development is steered away from areas at high risk of flooding, where possible. Where there are no reasonably available sites in Flood Zone 1, the flood risk vulnerability of land uses and reasonably available sites in Flood Zone 2 should be considered, applying the Exception Test if required.

⁵ See Appendix 3 for details of approach

2.1.19 Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in higher risk Flood Zone 3a be considered. This should take into account the flood risk vulnerability of land uses and the likelihood of meeting the requirements of the Exception Test if required.

2.1.20 Further details on the Sequential and Exceptions tests can be found in Section 3.3 and Figure 4 of the SPD.

2.1.21 For small scale proposals (home extensions, or non-domestic extensions of less 250sqm footprint) if the site is identified in a medium to high risk flood area the sequential or exceptions tests are not necessary. However, a site-specific Flood Risk Assessment (FRA) will be required to demonstrate that the development is not at risk of flooding and there is no increase in flood risk elsewhere as a result of the development.

Why are FRAs required?

2.1.22 FRAs are required to provide an assessment of flood risk and demonstrate how the proposed development will be made safe, will not increase flood risk elsewhere and where possible will reduce flood risk overall. The objectives of an assessment are to establish:

- whether it is likely to be affected by current or future flooding from any source;
- what measures are proposed to deal with these effects and risks are appropriate;
- evidence to show that the development does not increase the risk of flooding elsewhere by not impeding flow or reducing flood storage capacity;
- whether development is safe for its lifetime and passes the Exception Test, if applicable; and the evidence for the local planning authority to apply (if necessary) the Sequential Test.

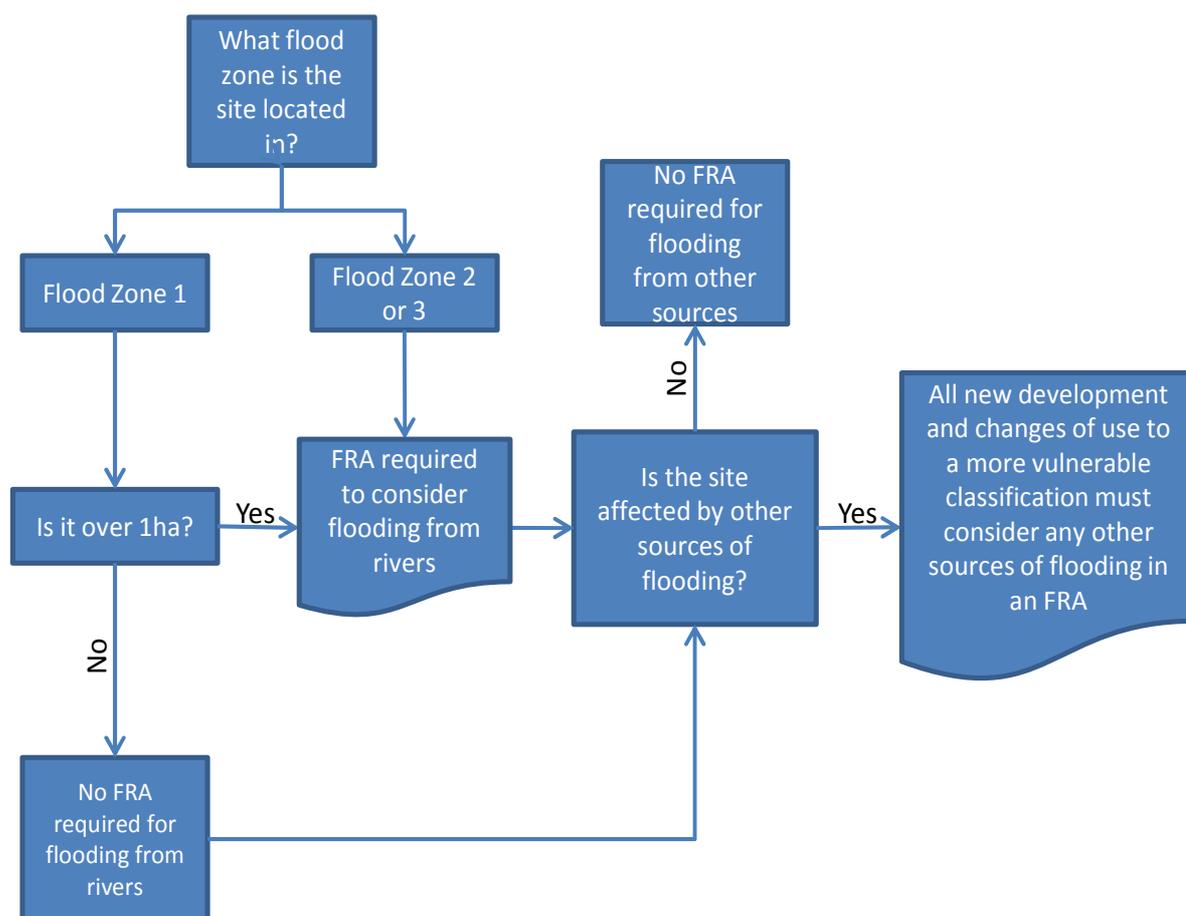
Is a FRA required?

2.1.23 A site-specific FRA is carried out to assess the flood risk to and from a development and should accompany a planning application, where appropriate.

2.1.24 Before proceeding all applicants are advised to use the flow chart (Figure 3) and information below to determine if a FRA is required. This applies to all development including small scale development⁶ but excluding proposals where there will be no impact on flood risk e.g. loft conversions and first floor extensions above an existing ground floor extension where there is no change of use and non-ground based adverts.

⁶ Small scale development – **non-residential extensions**: industrial/commercial/leisure etc extensions with a footprint of 250 sqm or less; **alterations**: development that does not increase the size of buildings e.g. alterations to external appearance; **householder development**: For example; extensions to the existing dwelling, sheds, garages, games rooms etc. within the curtilage of the existing dwelling. Specifically, this definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling and as well as the subdivision of houses into flats.

Figure 3: Determining whether a FRA is required



Who should prepare a FRA?

2.1.25 A FRA and any accompanying Surface Water Drainage Pro-forma should be prepared by a suitably qualified person e.g. drainage engineer (recognised by the Engineering Council⁷, the Institute of Civil Engineers⁸ or equivalent). This is particularly important in cases where the risk of flooding is high.

How to prepare a FRA?

2.1.26 Section 3 of this guidance provides a step-by-step guide to preparing an FRA and completing the **FRA Proforma** to support a planning application. It will help to ensure that it is suitable to the scale, nature and type of development proposed as well as the degree of flood risk and contains sufficient information to support decision making.

⁷ Engineering Council - <http://www.engc.org.uk/>

⁸ Institute of Civil Engineers - <https://www.ice.org.uk/>

What needs to be addressed in a FRA?

2.1.27 The requirements for a FRA will vary depending on the degree and type of flood risk, scale and nature of development, its vulnerability classification and whether or not the Sequential or Exceptions Tests are required (See Section 2.1.16 and 3.3). For example, where the development is an extension to an existing house in a lower risk area, the Council would generally require a less detailed assessment in order to make an informed decision.

2.1.28 Site specific FRAs should make full use of readily available information in the first instance, for example the mapping within the SFRA, although in some cases additional modelling, detailed calculations or site surveys will need to be undertaken.

Enough information must be included to enable the Council to determine that the development is safe and does not increase flood risk elsewhere and, where possible, reduces risk overall. If sufficient information is not provided this could result in the application being refused.

How to obtain pre-application advice?

2.1.29 The Council, Environment Agency and Surrey County Council all offer pre-application advice services (Table 9) to provide information on flood risk, drainage issues, required assessments / tests and other necessary consents. This will assist applicants in scoping the requirements of a FRA. Where to go for advice will depend on the specific issues for the particular development in question and who is consulted as part of the planning process. The Council strongly advises applicants to use these services.

Table 9 – Pre-application advice services

Strategy/Guidance document	Type of advice	How to obtain advice
Elmbridge Borough Council – Pre-application advice* [Charge]	Site –specific advice on potential sources of flood risk and content of an FRA	Different levels of service offered – Gold, Silver, Bronze and Platinum. http://www.elmbridge.gov.uk/planning/enquirysevice.htm
Elmbridge Borough Council – Duty Planning Officer* [No charge]	<ul style="list-style-type: none"> • Provide general non –site specific advice • Help identify planning constraints Guidance on how to make an application	Operates between 10.00am to 1.00pm Monday-Friday via phone or face-to-face http://www.elmbridge.gov.uk/planning/advice.htm [01372 474474]

Elmbridge Borough Council – Planning Policy [No charge]	General advice on flooding policies.	Operate between 9.00am to 5pm Monday-Friday via phone or face-to-face.[01372 474474]
Surrey County Council [Charge]	Advice only on surface water requirements for major applications.	Request for advice can be made via flooding.enquiries@surreycc.gov.uk
Environment Agency [No charge]	Free preliminary opinion	Request for advice made via https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion
Environment Agency [Charge]	Technical feedback, to help to ensure applicants have included all of the relevant information.	Request for advice made via https://www.gov.uk/government/publications/planning-advice-environment-agency-standard-terms-and-conditions

NB. Information correct as of November 2015.

*It should be noted that the pre-application provided by the Council is the Planning Officer's informal opinion based upon the information provided. A planning application is the subject of public consultation, which may result in additional issues getting raised that influence the decision-making process. Advice provided cannot fully anticipate the formal consideration process of a planning application; neither will it be binding on the consideration of any resulting application.

How to submit a valid planning application?

2.1.30 Where a FRA is required, this must be submitted alongside a planning application.

2.1.31 All major⁹ planning application must include a completed **FRA Proforma** using the template table included in Appendix 2. This should be included at the front of the assessment to summarise and signpost findings.

2.1.32 For minor¹⁰ development a FRA must be submitted. The Council recommends applicant's use the FRA Proforma as a checklist to assist them in producing FRA. Applicants may wish to submit this checklist as additional information.

2.1.33 Planning applications for small scale¹¹ development must be accompanied by a FRA, applicants are encouraged to use the FRA template included in Appendix 4.

2.1.34 Regardless of whether a FRA is required, all major¹² planning applications must submit a separate **Surface Water Drainage Pro-forma**¹³. Where appropriate this should be cross

⁹ Major planning applications – <http://www.legislation.gov.uk/ukxi/2010/2184/made>

¹⁰ Minor planning applications- <http://www.legislation.gov.uk/ukxi/2010/2184/made>

¹¹ Small scale developments- **non-residential extensions**: industrial/commercial/leisure etc extensions with a footprint of 250 sqm or less; alterations: development that does not increase the size of buildings e.g. alterations to external appearance; **householder development**: For example; extensions to the existing dwelling, sheds, garages, games rooms etc. within the curtilage of the existing dwelling. Specifically, this definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling and as well as the subdivision of houses into flats.

¹² Major planning applications – <http://www.legislation.gov.uk/ukxi/2010/2184/made>

¹³ Surface Water Drainage Proforma - <http://new.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/suds-planning-advice>

referenced within the FRA. For other applications where an FRA is required surface water drainage requirements must be addressed within the accompanying FRA.

2.1.35 Without the required information an application will not be validated. Please note the completion of a FRA will not automatically mean that the development is acceptable in flood risk terms.

Where a FRA is required this must be submitted alongside a planning application. For major applications a completed FRA Proforma and Surface Water Drainage Proforma also needs to be submitted. Without this information an application will not be validated.

Who will the Council consult with?

2.1.36 Depending on the type of application the Council will consult with different organisations as part of the planning application process.

2.1.37 Environment Agency is consulted in the following instances¹⁴:

- Flood Zone 3 - all applications (excluding small scale development);
- Flood Zone 2 – all applications (excluding small scale development) where the flood risk vulnerability is essential infrastructure; highly vulnerable; more vulnerable (where it is a landfill or waste facility or is a caravan site); less vulnerable (where it is land or building used for agriculture or forestry; a waste treatment facility; a mineral processing site, a waste water treatment plant); and
- Flood defence consent – any development (including small scale development) if it is within 20m of a Main River.

2.1.38 Surrey County Council (as the Lead Local Flood Authority) is consulted in the following instances:

- Flood defence consent – any development (including small scale) within 8m of an Ordinary Watercourse
- Surface Water Management requirements - all major applications

What are the requirements where planning permission is not required?

2.1.39 There are a wide variety of applications that require prior approval. The Council will consider these and the flood risk implications on a case by case basis.

2.1.40 Flood Defence consent may also be required for development requiring prior approval or permitted development (including minor development) and should be obtained as follows (Table 10).

Table 10 – Flood Defence consent

When to obtain consent	How to obtain consent
Within 8m of a Main River and any works in over or under the channel of a main river	Environment Agency - enquiries@environment-agency.gov.uk
Within 8m of an Ordinary Watercourse	Surrey County Council (as Lead Local Flood Authority) - landdrainage.consents@surreycc.gov.uk .

¹⁴ Correct as of November 2015



How does the Council make decisions?

2.1.41 Whilst the Environment Agency and Lead Local Flood Authority are consulted for flood risk advice on higher risk and larger proposals, all decisions on planning applications rest with the Council. In all respects, this SPD and guidance within the SFRA should be used to prepare FRAs. This will help to ensure that local policy and issues have been addressed and that sufficient information is included in order for the Council to make a decision and, where appropriate, consultees to provide advice.

2.1.42 Whether or not an application has addressed the detailed requirements for the content of a FRA/ Surface Water Drainage Pro-forma will be considered by the Case Officer and relevant consultees when assessing the application. Where sufficient information has not been provided this could result in the application being refused.

Will any other formal consents be required?

2.1.43 Flood Defence Consent is required for any works in, over or under the channel of a main river or within 8 metres of the top of the bank required the Environment Agency's prior Consent. If the watercourse benefits from the presence of flood defences, the Byelaw width is measured to be 8m landward from the toe of the flood defence.

2.1.44 The Environment Agency will be consulted on applications for works within 20 metres of an Ordinary Watercourse in accordance with the Environment Agency's flood Standing Advice.

2.1.45 As the requirements of the consenting process may result in changes to development proposals or construction methods, the Council will aim to consult the relevant organisations and advise on this as part of the planning process. Consents will be refused if the works results in an increase in flood risk, a prevention of operational access to the watercourse and/or an unacceptable risk to nature conservation.

Part 3: Completing an FRA

3.1 Parts 1 & 2 of FRA: Site information and proposed development

3.1.1 This Section will help applicants to complete Parts 1 and 2 of the FRA Proforma and the small scale development FRA template. Much of this information will have been gathered through completing Section 2.1. Further detail on each element of the Proforma is given below alongside the relevant sources of information.

Site information

3.1.2 It is important at this stage to ensure that sufficient plans are provided showing the site boundary, features including ground level, watercourses and other bodies of water as well as any structures which may influence the flow of flood water. A site survey may be necessary to ensure all such structures are identified.

Sources of information: SFRA Appendix B & E, Ordnance Survey mapping, Site Survey

Proposed development

3.1.3 When considering the location of development it is necessary to take account of the vulnerability of its users. To enable this, the Government has set out a list of vulnerability classifications (Appendix 1). The vulnerability classification of a development influences how risk is dealt with, if a FRA is required and what types of development are appropriate or not in different Flood Zones. Applicants need to determine the current and proposed use of the development and their respective vulnerability classifications.

Sources of information: SPD Section 2.1, SPD Appendix 1

3.2 Part 3 of FRA: Assessing flood risk

3.2.1 This Section will assist applicants in completing Part 3: Assessing Flood Risk of the FRA Proforma. It will also inform the identification of appropriate mitigation measures and thus help to complete Part 4: Managing and Mitigating flood risk of the Proforma (Section 3.4).

3.2.2 Section 2.1 provides a starting point to understanding the sources of flood risk that affect a site with this section adding further detail regarding the exact nature and degree of risk. Further detail on each element of the Proforma and the small scale development FRA template is provided below along with references to key sources of information. In particular, Appendix E of the SFRA provides a useful overview of risk for each settlement area.

3.2.3 The level of assessment will depend on the degree and type of flood risk, scale and nature of development and its vulnerability classification. For example, a development within a high risk area may require additional modelling to confirm the exact nature of risk specific to that site. Applicants are advised to take advantage of the pre-application services set out in Section 2.1 in order to scope the likely level of assessment required.

Topography, Geology and Landscape features

3.2.4 When considering flood risk at the site level it is important to understand how the topography, geology and landscape features of the site influence the nature and degree of risk. For example, lower ground levels could cause floodwater to pond, steep slopes may increase run-off rates and vegetation will affect the speed that water flows away. Similarly, the underlying ground conditions of a site will influence saturation and run-off rates and thus affect the time period over which a site may be affected by flooding.

3.2.5 Whilst information within the SFRA will provide a useful overview across the Borough, site surveys and ground investigation reports may be necessary to confirm the exact nature of local topography and ground conditions affecting a site and its influence on flood risk within the site and surrounding area.

Sources of information: SFRA Appendix B, Figure B1 & Appendix E; Site Survey

Watercourses

3.2.6 There are five Main Rivers in Elmbridge. These are shown below along with the catchment area they are located within.

- River Wey (Lower Wey)
- River Mole (Middle and Lower Mole)
- Dead River
- River Rythe
- River Thames (Lower Thames)

3.2.7 There are also a number of smaller Ordinary Watercourses and Drainage Ditches in the Borough. These are small streams, ditches and drainage channels that form tributaries to the Main Rivers.

Sources of information: SFRA Appendix B, Figure B4 & Appendix E

Flooding from Rivers

3.2.8 The Environment Agency undertakes updates to flood risk modelling to determine the risk of flooding from rivers and categorises areas into low, medium, and high risk (Flood Zones 1, 2 and 3 – Table 11) in relation to a range of annual probability events. This is published on their Flood Map for Planning (Rivers and Sea). The Functional Floodplain (Flood Zone 3b) is not separately defined from Flood Zone 3 on the Flood Map for Planning (Rivers and Sea) but identified by the Council within the SFRA, in discussion with the Environment Agency. The SFRA mapping therefore reflects the zones as depicted in the Flood Map for Planning (Rivers and Sea) and identifies Flood Zone 3b. More information on how this has been defined is provided below. It is therefore essential when checking Flood Zone extents to always refer to the Council’s SFRA mapping¹⁵.

Sources of information: SFRA Appendix C and Appendix E

Table 11- Flood Zones

Flood Zone	Flood Zone definition	Risk
Flood Zone 1	Less than 1 in 1,000 chance of river flooding each year (0.1% annual probability)	Low
Flood Zone 2	Between 1 in 100 and 1 in 1,000 chance of river flooding each year (between 1% and 0.1% annual probability)	Medium
Flood Zone 3a	Land having a 1 in 100 or greater chance of river flooding each year (greater than 1% annual probability)	High
Flood Zone 3b	Undeveloped land within the 1 in 20 year outline where water has to flow or be stored in times of flood, or land purposely designed to be flooded in an extreme flood event	Functional Floodplain

3.2.9 The modelling of the annual probability events does not take into account the presence of defences. Where a site cuts across Flood Zones a precautionary approach towards the higher Flood Zone will be taken.

Defining the Functional Floodplain in Elmbridge

3.2.10 In accordance with national policy and guidance the Council has defined the Functional Floodplain within the SFRA. Those areas within the 1 in 20 year (5%) or greater flood extent have been mapped. Within this outline, undeveloped areas, where water has to flow or be stored in times of flood, are defined as Functional Floodplain. However, in Elmbridge, there are some areas within the 1 in 20 year (5%) or greater flood extent that are already developed and are prevented from flooding by the presence of existing infrastructure or solid buildings. Whilst these areas will be subject to frequent flooding, it may not be practical to refuse all future development. As such, in accordance with national policy, existing building footprints where they can be demonstrated to exclude floodwater will not be defined as Functional Floodplain. Consideration of what is developed or undeveloped will be determined on a case by case basis, having regard to the presence of existing (non-floodable) buildings on the site and the routing of floodwater through the site in times of flood. Appendix 3 contains further details of the Council’s approach to development in these areas.

¹⁵ The Environment Agency issue updates to their mapping on a quarterly basis. Where updates affect Elmbridge, this will be reflected within the SFRA mapping

Depth, velocity and hazard

3.2.11 A range of additional data is available for each of the Main Rivers including information on the flood extent, depth and velocity (speed of flow) (Table 12).

Table 12- Modelling information for Main Rivers

River catchment	Information available
Lower Wey	1D-2D model. Flood extent, flood depth and velocity for each annual probability event
Lower Mole (Esher Railway Bridge to confluence with Thames at Molesey)	1D model. Flood extent for each annual probability event
Middle Mole (From Sidlow in Reigate to Esher Railway Bridge)	Flood extent, flood depth, and velocity for each annual probability event. NB: The Environment Agency is currently remodelling this section of the River Mole.
Dead River	1D-2D model. Flood extent, flood depth, velocity and hazard rating for each annual probability event
Lower Thames (Hurley to Teddington)	1D-2D model. Flood extent, flood depth, velocity for each annual probability event. NB: The Environment Agency is currently remodelling this section of the River Thames. Whilst the 1D modelling has been completed, the more detailed 2D Modelling is on going. It is anticipated that the Flood Map for Planning (Rivers and Sea) will be updated with the results of this modelling early 2016
River Rythe	The Environment Agency is currently undertaking a modelling study for the River Rythe.

NB. Details correct as of November 2015.

3.2.12 The information on flood extents is depicted within the SFRA mapping. More detailed information on depth, velocity and hazard as well as the model itself are available as a range of 'products' that can be obtained from the Environment Agency. Product 4 relates to depth and extent of flooding, where it has been modelled. This information is essential to inform the design of the scheme and mitigation measures including safe access/egress routes, finished floor levels etc or as a basis for undertaking additional modelling. This information is provided free of charge to householders.

To obtain a flood risk 'product' contact the Environment Agency via:
enquiries@environment-agency.gov.uk or telephone 03708 506506

Sources of information: Additional modelling may be required depending on the information available within the flood risk 'products' for the relevant watercourse, the nature of the proposals and mitigation measures required

Taking account of climate change

3.2.13 As part of the modelling studies for rivers in Elmbridge simulations have been run for the 1% annual probability (1 in 100 year/Flood Zone 3) including the implications of climate change. It should be noted however, that this does take account of the presence of defences.

3.1.14 This means for example sites indicated to be in lower risk areas (Flood Zone 2) could in future be in a higher risk zone (Flood Zone 3a). This predicted greater risk needs to be addressed within a Flood Risk Assessment demonstrating that proposal is safe, does not increase the risk of flooding or impeded flows over the lifetime of the a development¹⁶. The FRA must be accordance with the latest Environment Agency's guidance on taking account of Climate Change.

Sources of information: SFRA Appendix C, Appendix E

Dry Islands

3.2.15 The floodplain within Elmbridge is relatively flat but there are areas of slightly higher ground which are less prone to flooding than the land around them or may not flood at all. These areas would however, be surrounded by water in times of flood and are often referred to as 'dry islands'. During times of flood it may be difficult to find a dry route of escape and those located in these areas may be unable to leave or require rescuing by the emergency services. Therefore, applicants should not only look at risk on the proposed site but also in relation to the wider area.

Sources of information: SFRA Appendix C, Appendix E

Historic river flooding

3.2.16 There is a long history of flooding from rivers in Elmbridge particularly in the Lower Thames, Lower Wey and Middle Mole catchments. There are no recorded flood events on the Dead River or the Lower Mole since the completion of the Lower Mole Alleviation Scheme in 1991.

Sources of information: SFRA Appendix C, Appendix E

Existing flood risk management schemes

3.2.17 The Environment Agency's Asset Information Management System (AIMS) contains details of flood defence assets associated with Main Rivers. The majority of watercourses are not formally defended but may be informally defended by the presence of higher ground.

3.2.18 Formal flood defences are present on both sides of the River Mole (Lower Mole Catchment) from West End, Esher to its confluence with the River Thames. These defences form part of the Lower Mole Flood Alleviation Scheme and are shown as an 'Area Benefitting from Defences for Flood Zone 3' on the SFRA maps.

¹⁶ The lifetime of a proposed development is assumed to be 100 years for residential and 60 years for commercial.

Sources of information: SFRA Appendix C, Appendix E , Catchment Flood Risk Management Plan - https://consult.environment-agency.gov.uk/portal/ho/flood/draft_frmf/consult?pointId=s1407245469487

Flooding from Land (surface water)

3.2.19 Overland flow and surface water flooding typically arise following periods of intense rainfall, often short duration that is unable to soak into the ground or enter the drainage system. It can run quickly off land and result in localised flooding.

Risk of flooding from surface water

3.2.20 The Environment Agency has undertaken modelling of surface water flood risk at a national scale and produced mapping identifying those areas at risk of surface water flooding during three annual probability events: 3.33% annual probability (1 in 30 year) (High); 1% annual probability (1 in 100 year) (Medium/Low) and 0.1% annual probability (1 in 1,000 year) (Low) . Remaining areas would be classified as Very Low (<0.1% annual probability). The latest version of the mapping is referred to as the 'updated Flood Map for Surface Water' (uFMfSW) and is reflected within the SFRA mapping.

3.2.21 If a site is at High or Medium/Low Risk of flooding and there is a history of flooding in the area (see below) a topographic survey and/or additional modelling may be required to assess the degree and nature of risk.

3.2.22 Estimated depths of surface water flooding can be obtained from Surrey County Council and will be important in informing the design of mitigation measures. This information is available from the Environment Agency's 'updated Surface water dataset (uFMfSW).

Historic surface water flooding

3.2.23 Historical records of flooding are recorded by Surrey County Council, Elmbridge Borough Council, Highways England and the Environment Agency and are shown in the SFRA mapping.

Sources of information: SFRA Appendix C, Appendix E, Topographic Survey and or Site Walkover may be required; Surrey County Council

Groundwater flooding

3.2.24 Groundwater flooding usually occurs in low lying areas underlain by permeable rock and aquifers that allow groundwater to rise to the surface through permeable subsoil following long periods of wet weather.

Risk of flooding from groundwater

3.2.25 If a site is indicated to either have potential for groundwater flooding to occur at the surface or for properties situated below ground level the Council will require a detailed ground investigation report and hydrology report to be prepared as part of a FRA. Development, particularly subsurface development e.g. basements, in these areas may affect groundwater flows. Even though the displaced water may find another course this may have implications for the surrounding area.

FRAs must include proposals for mitigation measures e.g. perimeter drainage to ensure that existing sub-surface flows are not disrupted.

Historic groundwater flooding

3.2.26 Historical records of flooding are shown in the SFRA mapping. If the site has been affected by flooding in the past and the source is unknown this is likely to warrant further investigation.

Sources of information: SFRA Appendix B, Figures B2, B3 and B5, Appendix C Appendix E, Ground Survey Investigation/Hydrology Report may be required

Flooding from Sewers

3.2.27 Flooding from the sewer system can occur:

- During periods of heavy rainfall;
- If the system becomes blocked by debris;
- If the system surcharges due to high water levels in receiving watercourses

Historic sewer flooding

3.2.28 Thames Water holds records of internal and external property flooding by postcode area which is re-produced in the maps within the SFRA. An asset location plan can also be provided by Thames Water should this be necessary.

Sources of information: SFRA Appendix B, Figures B7 and B8; Thames Water asset location plan

Applicants are reminded to liaise with Thames Water about connections to the sewer system and to submit information with any planning application to demonstrate sewer capacity either exists or will be provided prior to occupation of the development.

Flooding from reservoirs and other artificial sources

3.2.29 There are four large water supply reservoirs present in Elmbridge,

- Queen Elizabeth II Storage, Walton
- Bessborough Reservoir, Walton
- Knight Reservoir, Walton
- Island Barn Reservoir, East and West Molesey

3.2.30 The Environment Agency dataset 'Risk of Flooding from Reservoirs' shows that the northern fringe of Walton on Thames Settlement Area could be flooded if the Queen Mary Reservoir located within the neighbouring borough of Spelthorne was to fail and release the water it holds.

3.2.31 Thames Water Utilities Ltd is responsible for the management of these reservoirs and ensuring all the required safety standards are met. The Environment Agency is the enforcement authority and all reservoirs are regularly inspected. Reservoirs in the UK have an extremely good safety record and therefore present minimal risk. The Environment Agency publish mapping that

identified areas that could be flooded if a large reservoir were to fail and release the water it holds. This is known as the 'Risk of Flooding from Reservoirs' and is available on the Environment Agency website. There are also a number of other artificial water bodies in Elmbridge.

Sources of information: SFRA Appendix B, Figure B4; [Risk of Flooding from Reservoirs](#)



3.3 Part 4 of FRA: Avoiding Flood Risk

Although not all developments will need to pass the Sequential and Exceptions Tests, they will still require a FRA to demonstrate how the development can be made safe and that it does not increase flood risk elsewhere as well as taking into account other sources of flooding.

3.3.1 The following section provides additional detail on when the Sequential and Exceptions Tests will be applied and how to meet the requirements.

What is the Sequential Test?

3.3.2 The Sequential Test is, in effect a sieving process designed to ensure that areas at little or no risk of flooding are developed in preference to areas at higher risk. The aim being to keep development out of medium and high risk areas (Flood Zones 2 and 3), and other areas affected by flooding, where possible.

When is the Sequential Test required?

3.3.3 The Sequential Test is required for individual planning applications located in Flood Zones 2 and 3 unless it is included in the list of exemptions shown below.

Exemptions

- Sites allocated in the Local Plan which have been sequentially tested
- A sequential test has already been undertaken for development of the type proposed on the site in question
- Small scale development¹⁷;
- Change of Use applications, unless it is for a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site.
- Development proposals in Flood Zone 1 unless the SFRA, or other more recent information, indicates there may be flooding issues now or in the future (for example, through the impact of climate change).
- Redevelopment of existing properties (e.g. replacement dwellings), provided they do not increase the number of dwellings in an area of flood risk such as replacing a single dwelling with an apartment block

3.3.4 There are some situations where an existing building is vacant because the use is no longer viable and conversion to an alternative use or inclusion of enabling development is necessary to secure its future, bring the site back into use or enable the continued use of a valuable business. In these cases, a reasonable and practical approach will be taken considering the other benefits of the development and the Council may agree that the Sequential Test need not

¹⁷ Small scale development – **minor non-residential extensions**: industrial/commercial/leisure etc extensions with a footprint of 250 sqm or less; **alterations**: development that does not increase the size of buildings e.g. alterations to external appearance; **householder development**: For example; extensions to the existing dwelling, sheds, garages, games rooms etc. within the curtilage of the existing dwelling. Specifically, this definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling and as well as the subdivision of houses into flats.

apply. Full justification and evidence must be provided. This will be applied only in exceptional circumstances and the resulting development must then pass both parts of the Exceptions Test ensuring it is safe and does not increase flood risk elsewhere.

How should the Sequential Test be applied for individual planning applications?

3.3.5 The following provides guidance for undertaking the Sequential Test for planning applications:

- Identify the geographical area of search over which the test is to be applied; this could be the Borough area, or a specific catchment if this is appropriate and justification is provided (e.g. school catchment area or the need for affordable housing within a specific area).
- Identify the source of 'reasonably available' alternative sites; usually drawn from evidence base / background documents produced to inform the Local Plan e.g. Land Availability Assessment¹⁸
- State the method used for comparing flood risk between sites; for example the Environment Agency Flood Map for Planning, the SFRA mapping, site-specific FRAs if appropriate, other mapping of flood sources.
- Apply the Sequential Test; systematically consider each of the available sites, indicate whether the flood risk is higher or lower than the application site, state whether the alternative option being considered is allocated in the Local Plan, identify the capacity of each alternative site, and detail any constraints to the delivery of the alternative site(s).
- Conclude whether there are any reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed.
- Where necessary, apply the Exception Test (see below).

3.3.6 Within each Flood Zone, surface water and other sources of flooding also need to be taken into account.

3.3.7 A site is considered 'reasonably available' under the following circumstances:

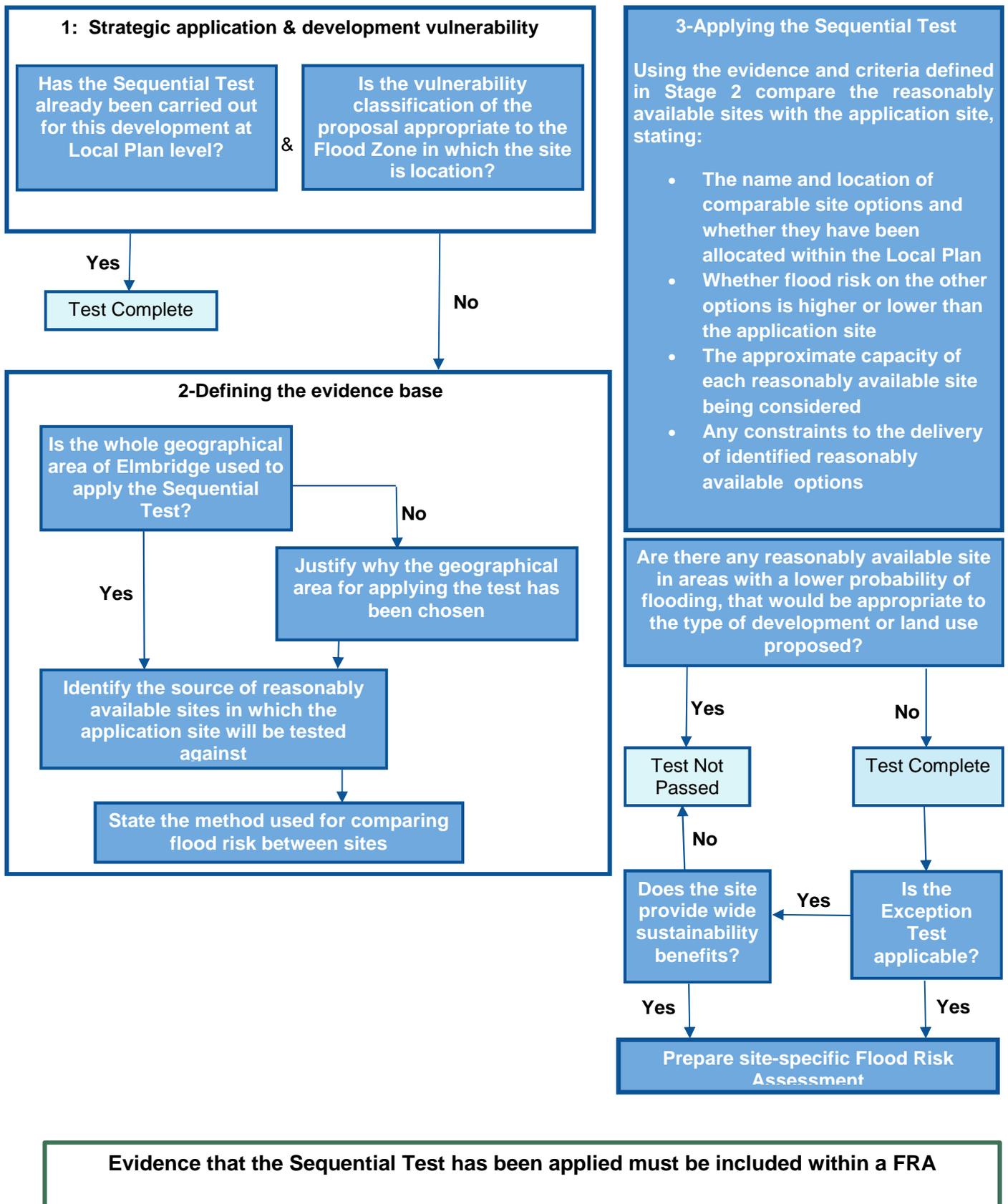
- It is of a comparable size and can accommodate the requirements of the proposed development;
- Either: owned by the applicant, for sale at a fair market value or is publicly owned and surplus; and
- It is not safeguarded in the Local Plan for another use.

3.3.8 A site would not be considered to be available if it fails to meet any of the above requirements or already has planning permission that is likely to be implemented.

3.3.9 Figure 4 below provides a flow chart of the Sequential Test process.

¹⁸ Land Availability Assessment - <http://www.elmbridge.gov.uk/planning/policy/evidencebase.htm>

Figure 4: Sequential Test process



What is the Exception Test?

3.3.10 Having completed the Sequential Test, the Exception Test aims to ensure that new development is only permitted in areas at risk of flooding where flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime, considering climate change and without increasing risk elsewhere.

For the Exception Test to be passed:

Part 1 - It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by the SFRA where one has been prepared; and

Part 2 - A site-specific Flood Risk Assessment must demonstrate that 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.

When is the Exception Test required?

3.3.11 Table 13 outlines when an Exceptions Test is required, in summary it is for:

- Essential Infrastructure development in Flood Zones 3a and 3b
- Highly Vulnerable development in Flood Zone 2
- More Vulnerable development in Flood Zone 3a

Table 13- Flood risk vulnerability and flood zone 'compatibility'

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

Key: ✓ Development is appropriate

X Development should not be permitted

Source: Planning Practice Guidance

How should the Exception Test be applied?

3.3.12 In terms of addressing Part 1 of the Exceptions test applicants will be expected to demonstrate the sustainability benefits of their application by assessing it against the Council's

Sustainability Appraisal framework¹⁹ (Table 13). It is not possible to confirm that certain benefits will always outweigh the flood risk and Part 1 of an Exception test will be considered on an individual basis taking into account the proposed use /s and the demonstrated need. This will be considered against the Sustainability Appraisal Objectives and the most up to date relevant evidence bases. The Council will seek the advice of statutory stakeholders as required.

3.3.13 It is, however, very unlikely that the following circumstances would be considered as providing, on their own, sufficient benefits to the community to outweigh the flood risk:

- A new open market dwelling, for example on garden land in a residential area and close to a bus stop. Whilst the location close to a bus stop is desirable it will not normally be sufficient to outweigh the flood risk.
- An energy-efficient new building.
- The personal circumstances of the applicant or occupier.

Table 14- SA framework

Sustainable Appraisal Objectives	
Social progress that meets the needs of everyone:	
1.	To provide sufficient housing to enable people to live in a home suitable to their needs and which they can afford.
2.	To facilitate the improved health and wellbeing of the whole population.
3.	To conserve and enhance, archaeological, historic and cultural assets and their settings.
4.	To reduce the need to travel, encourage sustainable transport options and improve accessibility to all services and facilities.
5.	To make the best use of previously developed land and existing buildings.
6.	To support economic growth that is inclusive, innovative and sustainable
7.	To provide employment opportunities to meet the needs of the local economy.
8.	To reduce greenhouse gas emissions and move to a low carbon economy.
9.	To use natural resources prudently.
10.	To adapt to the changing climate
11.	To reduce flood risk.
12.	To improve the water quality of rivers and groundwater, and maintain an adequate supply of water.
13.	To reduce land contamination and safeguard soil quality and quantity.
14.	To ensure air quality continues to improve and noise and light pollution are reduced.
15.	To protect and enhance landscape character.
16.	To conserve and enhance biodiversity.

3.3.14 Section 3.4 shows how Part 2 of the Exception Test can be met through the incorporation of appropriate mitigation measures.

¹⁹ These have been reviewed and updated following the adoption of the Core Strategy and Development Management Plan

3.4 Part 5 of FRA: Managing and Mitigating Flood Risk

3.4.1 This Section will provide guidance on how to complete Part 5 of the FRA Proforma: Managing and Mitigating Flood Risk.

What mitigation measures are required?

3.4.2 Mitigation measures should be seen as a last resort to address flood risk issues to new development. However, where development takes place in an area at risk of flooding it must demonstrate, through the production of a site specific FRA that it is:

- Safe for its lifetime
- Does not increase the risk of flooding elsewhere
- Where possible, reduces flood risk overall

3.4.3 A range of mitigation measures can be integrated into a development in order to manage and mitigate flood risk and achieve the above. This addresses Part 2 of the Exception Test (See Section 3.3).

How should mitigation measures be designed?

3.4.4 All mitigation measures should be designed with an allowance for climate change over the lifetime of the development as follows:

- 100 years for residential developments; and
- 75 years for commercial/industrial development, or other time horizons specific to the non-residential use proposed

What are the options for mitigating flood risk?

3.4.5 Different measures will be appropriate/necessary in different circumstances depending on the nature of flood risk, vulnerability of the development, site conditions etc. For example the design of a safe route of escape or the height to which floor levels should be raised will be influenced by the predicted depth and velocity of flooding affecting a site. Table 15 provides a summary of each mitigation measure and the following sections provide further detail.

Table 15- Mitigation measures

Mitigation measure	Description
Development layout and sequential approach	Applying the sequential approach within development sites, directly more vulnerable development to areas of lower risk
Finished Floor Levels	Raising floor levels above flood levels
Flood Resistance	Aimed at preventing water ingress and minimising impact. Applicable to flood depths <0.3m. Include use of materials with low permeability, land raising, flood gates etc
Flood Resilience	Allows water entry but minimises damage to allow rapid re-occupancy. Applicable to flood depths >0.6m. Include use of materials with good drying/cleaning properties, raising electrical wiring, tanking basements etc

Mitigation measure	Description
Safe access and egress	Enabling the safe evacuation of people, providing emergency services with access and enable flood defence authorities to carry out duties in times of flood
Floodplain compensation storage	Ensuring development does not impact upon the ability of the floodplain to store water in time of flood by providing level for level, volume for volume compensation.
Flood voids	Voids below buildings that allow water to flow and be stored. Can be used in combination with compensation storage or alone.
Flow routing	Allows the free flow of water and ensures floodwaters are not diverted or backwater effects
Riverside development	Retention of undeveloped buffer strips alongside main rivers and ordinary watercourses.
Sustainable Drainage Systems	Measures to reduce or manage surface water runoff to and from proposed development to achieve specific run-off rates. Two types: Attenuation and Infiltration. Attenuation applicable everywhere, Infiltration only applicable in some areas. Examples include, wetland ponds, permeable surfaces, green roofs etc
Flood Warning and Evacuation Plans	Plan to show what actions occupants of the site should take before, during and after a flood to ensure their safety, and to ensure safe access by emergency services etc

Development Layout and Sequential Approach

Locate the most vulnerable elements of a development in the areas at lowest flood risk

3.4.6 The principle of avoiding flood risk should be applied within development sites and buildings to locate the most vulnerable elements in the areas of lowest risk. For example, a residential use should be restricted to areas at lowest risk of flooding whereas parking, open space and landscaped areas can be placed in areas at higher risk.

3.4.7 This principle can also be applied within buildings. For example, locating residential development on the first floor in a mixed-use scheme or locating sleeping accommodation on the first floor to ensure a 'safe place'.

FRAs should include plans showing how sensitive uses have been placed in areas of lower risk.



Finished Floor Levels

For residential development finished floor levels should be set 300mm above the known or modelled 1 in 100 year flood level (Flood Zone 3) including an allowance for climate change or estimated flood depth for surface water flooding. Floor levels may not need to be raised for other types of development where buildings can be designed to be floodable e.g. Less Vulnerable.

3.4.8 Where development takes place in areas at risk of flooding ideally internal floor levels should be raised 300mm above the known or modelled 1 in 100 year (Flood Zone 3) flood level including an allowance for climate change or the estimated depth of surface water flooding (see para.3.2.22 for details on estimated depths of flooding).

FRA's must include plans showing finished floor levels in relation to Ordnance Datum taking account of indicative flood depths.

3.4.9 This may not be possible in all cases e.g. extensions or necessary where buildings can be designed to be floodable e.g. Less Vulnerable uses. In these cases, options for a reduction in floor levels subject to appropriate resistance/resilience measures should be set out within a FRA. The following table provides a guide to the requirements (Table 16).

Table 16- Finished Floor Levels

Development type	Flood Zone 3	Flood Zone 2
Minor residential development	Floor levels within the proposed development will be set no lower than existing levels AND, flood proofing of the proposed development has been incorporated (see page 35) OR, Floor levels within the extension will be set 300mm above the known or modelled 1 in 100 (1%) year flood level including climate change.	Floor levels within the proposed development will be set no lower than existing levels AND, flood proofing of the proposed development has been incorporated (see page 35).
Other development - Residential	Where appropriate, subject to there being no other planning constraints (e.g. restrictions on building heights), finished floor levels should be set a minimum of 300mm above the 1% annual probability flood level (1 in 100 year) including climate change. Sleeping accommodation should be restricted to the first floor or above to offer the required 'safe places'. Internal ground floors below this level could however be occupied by either Less Vulnerable commercial premises, garages or non-sleeping residential rooms (e.g. kitchen, study, lounge) (i.e. applying a sequential approach within a building).	
Other development - Non-residential	Finished floor levels may not need to be raised. For example, Less Vulnerable developments can be designed to be floodable instead of raising floor levels, and this may be beneficial to help minimise the impact of the development on the displacement of floodwater and the risk of flooding to the surrounding area. However, it is strongly recommended that internal access is provided to upper floors (first floor or a mezzanine level) to provide safe refuge in a flood event. Such refuges will have to be permanent and accessible to all occupants and users of the site and a Flood Warning and Evacuation Plan should be prepared to document the actions to take in the event of a flood (see Section below).	

Development type	Flood Zone 3	Flood Zone 2
Basement dwellings	Basements, basement extensions, conversions of basements to a higher vulnerability classification or self-contained units are not permitted in Flood Zone 3b. Self-contained residential basements and bedrooms at basement level are not permitted in 3a. Internal access to a higher floor situated 300mm above the 1% annual probability flood level (1 in 100 year) including climate change must be provided for all other basements, basement extensions and conversions.	All basements, basement extensions and conversions must have internal access basement higher floor situated 300mm above the 1% annual probability flood level (1 in 100 year) including climate change.

Flood Resistance or Water Exclusion Strategy

Resistance measures should be employed where a site is affected by river or surface water flooding and predicted **flood depths are less than 0.3m** and likely to be for short duration.

3.4.10 Flood resistance measures aim to keep water out and give occupants time to relocate ground floor contents. There are a range of flood protection devices/methods including:

- Using materials and construction with low permeability
- Landscaping e.g. creation of low earth bunds (subject to this not increasing flood risk elsewhere)
- Raising thresholds and finished floor levels (See previous section) e.g. porches with higher thresholds than main entrance
- Flood gates with waterproof seals
- Sump and pump for floodwater to remove waste water faster than it enters
- Door guards and airbrick covers

Flood Resilience or Water Entry Strategy

Resilience measures should be employed where a site is affected by river or surface water flooding and **flood depths are greater than 0.6m** where it is likely that structural damage will occur due to excessive water pressure.

3.4.11 Flood resilience measures are designed to allow water in but to limit damage and allow rapid re-occupancy. There are a range of options:

- Use materials with either good drying and cleaning properties, or, sacrificial materials that can easily be replaced;
- Design for water to drain away;
- Design access to all spaces to permit drying and cleaning;
- Raise the level of electric wiring, appliances and utility metres (0.1m above flood level);
- Ground supported floors with concrete slabs coated with impermeable membrane;
- Tank basements, cellars and ground floors with water resistant membranes; and
- Plastic water resistant internal doors.

3.4.12 Resilience measures are appropriate for uses where temporary disruption is acceptable and suitable warning received. It may be appropriate to use resistance measures alongside this with the aim of buying time for removal of valuables and safe evacuation. This approach is most suited where the rate of flood water rise is relatively slow i.e. several hours.

3.4.13 For flood depths of between 0.3 and 0.6m a decision needs to be taken as to whether it is feasible or practical to adopt resistance measures. If structural integrity is a concern then it would be advisable to allow for partial water entry.

Refer to CLG, 2007, Improving the Flood Performance of New Buildings, Flood Resilient Construction

FRAs must include details of the specific flood resilience and resistance measures to be employed including design drawings where appropriate.

Safety of Other Structures

3.4.14 Structures such as bus/bike shelters, benches and refuse bins should be flood resilient, firmly attached to the ground and designed to prevent debris becoming caught. Similarly, where depths greater than 300mm are expected, car parks should be designed to prevent vehicles from floating out of the car park.

Safe Access and Egress

3.4.15 Safe access and egress is required to enable the safe passage of people from the development and to provide emergency services and flood defence authorities with access to the development during times of flood.

A safe access/egress route should allow occupants to safely exit and enter the buildings via a 'dry' route above 1 in 100 year flood level 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.

Safe means of escape should also be provided for sites affected by surface water flooding taking account of predicted flood depths.

3.4.16 Guidance prepared by the Environment Agency²⁰ uses a calculation of flood hazard to determine safety in relation to flood risk. Flood hazard is a function of flood depth and flow velocity (speed) with a suitable debris factor to take account of hazard posed by any material caught up in the floodwater (Table 17).

²⁰ Environment Agency, HR Wallingford, May 2008, Supplementary note on Flood hazard ratings and thresholds for development planning and control purposes – http://evidence.environment-agency.gov.uk/FCERM/Libraries/FCERM_Project_Dcouments/FD2321_7400_PR_pdf.sflb.ashx

Table 17 – Hazard to People rating ($HR=d \times (v+0.5)+DF$)

Flood Hazard (HR)	Description
Less than 0.75	Very low hazard – Caution
0.75 – 1.25	Dangerous for some – includes children, the elderly and the infirm
1.25 – 2.0	Dangerous for most – includes the general public
More than 2.0	Dangerous for all – includes the emergency services

3.4.17 It is considered that flood depths below 0.25m and velocities below 0.5m/s are generally low hazard. When designing safe access and exit routes, the combinations of depth and velocity on the routes should correspond to very low hazards in the table above. Safe access/egress must be as follows in order of preference taking account of the vulnerability of its users:

- Safe dry route for people and vehicles;
- Safe dry route for people;
- If a dry route for people is not possible, a route for people where the flood hazard (in terms of depth and velocity of flooding) is very low and should not cause risk to people; and
- If a dry route for vehicles is not possible, a route for vehicles where the flood hazard (in terms of depth and velocity of flooding) is very low to permit access for emergency vehicles.

3.4.18 The means of escape must not impede the flow of floodwater or increase the risk of flooding elsewhere.

Safe refuge

3.4.19 In exceptional circumstances, dry access/egress above the 1 in 100 year (Flood Zone 3) flood level including climate change may not be achievable. In these cases, the Council will need to ensure that the safety of site occupants can be safely managed. This will be informed by the type of development, the number of occupants, their vulnerability, and the flood hazard along the proposed egress route. For example, this may entail the designation of a safe place of refuge on an upper floor of the building from which occupants can be rescued by emergency services. Sole reliance on a safe place of refuge will only be considered as a last resort and provision will not guarantee that an application will be granted.

FRAs must include a plan showing the proposed route of escape away from the site and/or details of safe refuge, including details of signage that will be on-site.

Floodplain Compensation Storage

Proposals in developed areas within the 1 in 20 (Flood Zone 3b) flood outline (including small scale development) and within Flood Zone 3a (excluding small scale development) should not result in a net loss of flood storage capacity. Where possible, particularly on larger sites, opportunities should be sought to achieve an increase in floodplain storage.

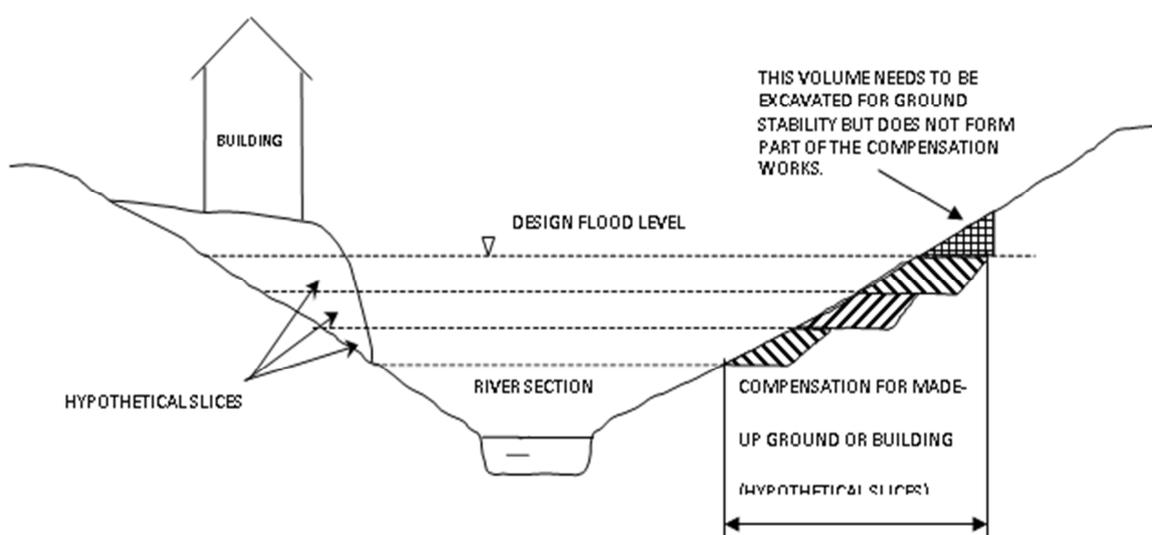
3.4.20 Where a proposed development results in a change in building footprint, the developer must ensure that it does not impact on the ability of the floodplain to store water, and in areas of higher risk e.g. Flood Zone 3b, should seek opportunities to provide betterment. Similarly, where ground levels are elevated to raise the development out of the floodplain, compensatory floodplain

storage within areas that currently lie outside the floodplain must be provided to ensure that the total volume of the floodplain storage is not reduced. As shown in Figure 5 below, true (direct) floodplain compensation must be provided on a level for level, volume for volume basis on land which does not already flood and is within the site boundary. Where land is not within the site boundary, it must be in the immediate vicinity, in the applicant's ownership and linked to the site²¹. 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. When designing a scheme flood water must be able to flow in and out and must not pond.

3.4.21 It is possible to provide off-site compensation within the local area e.g. on a neighbouring or adjacent site, or indirect compensation, by lowering land already within the floodplain, however, this would not provide true compensation and evidence would need to be provided to demonstrate that the proposals would improve and not worsen the existing flooding situation or could be used in combination with other measures e.g. voids to limit the impact on floodplain storage.

3.4.22 It is recognised that full compensation may not always be possible, particularly for minor development schemes and sites wholly within Flood Zone 3. In these cases full justification must be provided and other measures incorporated to help mitigate any loss of floodplain storage e.g. flow routing, flood voids, removal of non-floodable structures

Figure 5 - Example of direct Floodplain Compensation Storage (Environment Agency 2009)



Removal of other structures

3.4.23 In considering flood storage capacity the Council will take account of the potential beneficial effects of the removal of other structures providing it can be demonstrated that these are non-floodable. It is important to note that structures such as sheds and garages with a floor level close to the ground, where flood water would not normally be prevented from entering would contribute little to additional flood storage capacity if removed.

²¹ In hydrological connectivity.

Flood Voids

3.4.24 The use of under-floor voids with adequate openings beneath raised finished floor levels can be considered for development in Flood Zone 3. They are generally considered to provide indirect compensation for loss of floodplain storage.

3.4.25 Voids may be suitable where it is not possible to achieve all the direct compensation required or for small scale development where it can be difficult to achieve full compensation. Ideally, void openings should be a minimum of 1m long and open from existing ground levels to at least the 1% annual probability (1 in 100 year/Flood Zone 3) plus climate change flood level. By setting finished floor levels at 300mm above the design flood level, there is usually enough space for the provision of voids below. There should be a minimum of 1m of open void length per 5m length of wall. Void openings should be provided along all external walls. If security is an issue, 10mm diameter vertical bars set at 100mm centres can be incorporated into the void openings. The use of under-floor voids will typically require a legal agreement or planning condition and maintenance plan to ensure they remain open for the lifetime of the development. For small scale development different design criteria may be acceptable. Sole reliance on the use of under-floor voids to address the loss of floodplain storage capacity is generally not acceptable on undeveloped sites.

Car Parks

3.4.26 Where car parks are specified as areas for the temporary storage of floodwater, flood depths should not exceed 300mm given that vehicles may be moved by water of greater depths. Where greater depths are expected, car parks should be designed to prevent the vehicles from floating out of the car park. Signs should be in place to notify drivers of the susceptibility of flooding and flood warning should be available to provide sufficient time for car owners to move their vehicles if necessary.

FRAs must provide calculations or results of modelling and include cross-sectional drawings where appropriate. Details of maintenance regime must be provided.

Appendix 3 of CIRIA 2004, CIRIA Report 624: Development and Flood Risk – Guidance for the Construction Industry

Flow routing

New development within Flood Zones 2 and 3 or affected by surface water or groundwater flooding should not impact on the flow of floodwater (routing) e.g. give rise to backwater affects or divert water towards other properties

3.4.27 Potential overland and sub-surface flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards existing properties. Opportunities should be sought to make space for water:

- Removing boundary walls or replacing with other boundary treatments such as hedges, fences (with gaps).

- Considering alternatives to solid wooden gates, or ensuring that there is a gap beneath the gates to allow the passage of floodwater.
- On uneven or sloping sites, consider lowering ground levels to extend the floodplain without creating ponds. The area of lowered ground must remain connected to the floodplain to allow water to flow back to river when levels recede.
- Where proposals entail floodable garages or outbuildings, consider designing a proportion of the external walls to be committed to the free flow of floodwater.
- Perimeter drainage to ensure that existing sub-surface flows are not disrupted.

Evidence should be provided within a FRA to demonstrate that the proposed development will not impact on flood flows. This may require additional modelling.

Riverside development

All developments must retain an 8 metre undeveloped buffer strip alongside Main Rivers and a 5 metre wide buffer strip alongside Ordinary Watercourses.

3.4.28 An 8 metre wide undeveloped buffer strip alongside Main Rivers should be retained for maintenance purposes and to support the landscape and biodiversity of river corridors. Applicants, particularly for larger scale developments, will be expected to explore opportunities for riverside restoration.

3.4.29 A 5 metre wide undeveloped buffer strip should be retained alongside Ordinary Watercourses.

Plans should be included within FRAs to show how the development has been designed to incorporate riverside buffer zones.

3.4.30 Any proposed development adjoining the riverside should be designed to take account of other policies contained within the Elmbridge Local Plan and associated strategies as set out at the start of this SPD (Section 1.2). Applicants should consider how the proposed development enhances the landscape of the river including important views and vistas, contributes towards biodiversity, promotes heritage, supports public access wherever possible and recreational use of the waterway.

Flood Warning and Evacuation Plans

For all developments (excluding small scale development) proposed in Flood Zone 2 or 3, a Flood Warning and Evacuation Plan (FWEP) should be prepared to demonstrate what actions site users will take before, during and after a flood event to ensure their safety, and to demonstrate their development will not impact on the ability of the local authority and the emergency services to safeguard the current population.

For sites in Flood Zone 1 where the area surrounding the site and/or any potential egress routes away from the site may be at risk of flooding from any source ('dry island') or where it is directly affected by any other source of flooding it may also be necessary to prepare a FWEP.

For all minor development in Flood Zones 2 and 3, the Environment Agency has a tool on their website to create a Personal Flood Plan²². The Plan comprises a checklist of things to do before, during and after a flood and a place to record important contact details.

3.4.31 Evacuation is where flood alerts and warnings provided by the Environment Agency enable timely actions by residents or occupants to allow evacuation to take place unaided, i.e. without the deployment of trained personnel to help people from their homes, businesses and other premises. Rescue by the emergency services is likely to be required where flooding has occurred and prior evacuation has not been possible. FWEP should include:

3.4.32 How flood warning is to be provided, such as:

- Availability of existing flood warning systems;
- Where available, rate of onset of flooding and available flood warning time; and
- How flood warning is received.

3.4.33 What will be done to protect the development and contents, such as:

- How easily damaged items (including parked cars) or valuable items will be relocated;
- How services can be switched off (gas, electricity, water supplies);
- The use of flood protection products (e.g. flood boards, airbrick covers etc);
- The availability of staff/occupants/users to respond to a flood warning, including preparing for evacuation, deploying flood barriers across doors etc; and
- The time taken to respond to a flood warning.

3.4.34 Ensuring safe occupancy and access to and from the development, such as:

- Occupant awareness of the likely frequency and duration of flood events, and the potential need to evacuate;
- Safe access route to and from the development;
- If necessary, the ability to maintain key services during an event;
- Vulnerability of occupants, and whether rescue by emergency services will be necessary and feasible; and
- Expected time taken to re-establish normal use following a flood event (clean up times, time to re-establish service etc).

The FWEP or Personal Flood Plan - '[Make a Flood Plan](#)' - must be included as an Appendix to the FRA.

Flood Warning areas and Emergency Rest Centres

3.4.35 There are 13 flood warning areas in the Borough and those adjoining (Table 18). The Environment Agency issues flood warnings to residents and businesses that have registered for the service as to when flooding is expected.

²² Environment Agency Tool 'Make a Flood Plan'. <https://www.gov.uk/government/publications/personal-flood-plan>

Table 18- Flood Warning Areas

Watercourse	Flood Warning Area
River Wey	Walsham Meadow to Byfleet Town Wisley and Byfleet Weybridge
Thames	Hamm Court Molesey Sunbury Walton East and West Molesey Thames Ditton Thames Ditton Island Lower Hailliford
Mole	Esher and East Molesey Stoke D'Abernon, Cobham and South Hersham

3.4.36 Elmbridge has 7 emergency rest centres. It should be noted that although these have been identified as emergency rest centres, whether each of the centres are operational during a flood event is dependent upon the locations and extent of flooding across the Borough at that particular time. The Council will decide at the time of a flood event which centre will be used. See Appendix B, Figure B9 of the SFRA for details²³.

These should be referred to within the FWEP or Personal Flood Plan

Surface Water Management

All developments should not result in an increase in surface water runoff, and where possible, should demonstrate an improvement in terms of rates and volumes of surface water runoff. Sustainable Drainage Systems (SuDS) should be used to reduce and manage surface water run-off to and from proposed developments as near to source as possible.

3.4.37 Suitable surface water management measures should be incorporated into new development designs in order to reduce and manage surface water flood risk to, and from new development. This should be achieved by incorporating SuDS.

3.4.38 SuDS are typically softer engineering solutions inspired by natural drainage processes that manage water as close to its source as possible. Wherever possible, a SuDS technique should seek to contribute to each of the three goals identified below. Where possible SuDS solutions for a site should seek to:

1. Reduce flood risk (to the site and neighbouring areas),

²³ 3 additional warning areas have been added since the publication of the SFRA



2. Reduce pollution, and
3. Provide landscape and wildlife benefits.

3.4.39 Generally the aim should be to discharge surface water run-off as high up the following hierarchy of drainage options as reasonably practicable and subject to suitability:

1. Into the ground (infiltration)
2. To a surface water body
3. To a surface water sewer, highway drain, or another drainage system
4. To a combined sewer

3.4.40 SuDS techniques can be used to reduce the rate and volume and improve the water quality of surface water discharges from sites to the receiving environment (i.e. natural watercourse or public sewer etc.). The SuDS Manual²⁴ identified several processes that can be used to manage and control runoff from developed areas. Each option can provide opportunities for storm water control, flood risk management, water conservation and groundwater recharge.

- **Infiltration:** the soaking of water into the ground. This is the most desirable solution as it mimics the natural hydrological process. Where groundwater sources are vulnerable or there is risk of contamination, infiltration techniques are not suitable.
- **Detention/Attenuation:** the slowing down of surface flows before their transfer downstream, usually achieved by creating a storage volume and a constrained outlet.
- **Conveyance:** the transfer of surface runoff from one place to another, e.g. through open channels, pipes and trenches.
- **Water Harvesting:** the direct capture and use of runoff on site, e.g. for domestic use (flushing toilets) or irrigation of urban landscapes. The ability of these systems to perform a flood risk management function will be dependent on their scale, and whether there will be a suitable amount of storage always available in the event of a flood.

3.4.41 The application of SuDS is not limited to a single technique per site. Often a successful SuDS solution will utilise a combination of techniques. In addition, SuDS can be employed on a strategic scale, for example with a number of sites contributing to large scale jointly funded and managed SuDS. It should be noted, each development site must offset its own increase in runoff and attenuation cannot be “traded” between developments. Table 19 below outlines typical SuDS techniques.

3.4.42 As part of any SuDS scheme, consideration should be given to the long-term maintenance of the SuDS to ensure that it remains functional for the lifetime of the development.

3.4.43 The Lead Local Flood Authorities of South East England have also produced a useful document providing advice on what SuDS will be suitable in different locations and outlining the process for integrating SuDS into developments²⁵

²⁴ CIRIA C697 SuDS Manual. http://www.ciria.org/Resources/Free_publications/the_suds_manual.aspx

²⁵ Water People Places - <https://new.eastsussex.gov.uk/environment/flooding/sustainabledrainagesystems/>

Table 19: SuDS techniques
(Y: primary process. * some opportunities, subject to design)

Technique	Description	Conveyance	Detention	Infiltration	Harvesting
Permeable Paving	Permeable paving/surfaces allow rainwater to infiltrate through the surface into an underlying storage layer, where water is stored before infiltration to the ground, reuse, or release to surface water.		Y	Y	*
Filter Drains	Linear drains/trenches filled with a permeable material, often with perforated pipe in the base of the trench. Surface water from the edge of paved areas flows into the trenches, is filtered and conveyed to other parts of the site.	Y	Y		
Filter Strips	Grassed or planted areas designed to drain water and promote infiltration and cleansing	*	*	*	
Swales	Shallow vegetated channels that conduct and/or retain water, and can permit infiltration when unlined.	Y	Y	*	
Ponds	Depressions used for storing and treating water.		Y	*	Y
Wetlands	As ponds, but the runoff flows slowly but continuously through aquatic vegetation that attenuates and filters the flow. Shallower than ponds. Based on geology these measures can also incorporate some degree of infiltration.	*	Y	*	Y
Detention Basin	Dry depressions designed to store water for a specified retention time.		Y		
Soakaways	Designed to allow water to quickly soak into the permeable layers of soil. Constructed like a dry well, an underground pit is dug filled with gravel or rubble. Water can be piped into a soakaway where it will be allowed to gradually seep into the ground.			Y	
Infiltration Trenches	As filter drains, but allowing infiltration through trench base and sides.	*	Y	Y	
Infiltration Basins	Depressions that store and dispose of water via infiltration.		Y	Y	
Green Roofs	Planted soil layer constructed on the roof of a building to create a living surface. Water is stored in the soil layer and absorbed by vegetation.		Y		
Rainwater Harvesting	Rainwater is collected from the roof of a building or from other paved surfaces and stored in an overground or underground tank for treatment and reuse locally e.g. irrigation, toilet flushing	*	*	*	Y

3.4.44 The use of infiltration techniques is highly dependent on the underlying ground conditions. A assessment of the suitability of using infiltration SuDS techniques across the Borough has been undertaken as part of the SFRA and should be referred to when determining the types of SuDS to be employed. Detention, conveyance and harvesting measures are not constrained by geology.

Infiltration SuDS suitability - Appendix B6 of SFRA
[Water, People, Places: A guide for master planning sustainable drainage into development; SuDS Manual, CIRIA C697](#)

Non Statutory Technical Standards and supporting guidance

3.4.45 A set of non-statutory Technical Standards have been published, to be used in conjunction with supporting guidance in the PPG and sector guidance, which set the requirements for the design construction, maintenance and operation of SuDS²⁶.

[Local Authority SuDS Officer Organisation Best Practice Guidance](#)

For major schemes a separate Surface Water Drainage Proforma will need to be completed and referred to within the accompany FRA. For all other schemes surface water management will need to be addressed within the FRA

Securing mitigation measures

3.4.46 The Council will use planning conditions and in some cases legal agreements in order to secure mitigation measures and ensure they are maintained and operational for their lifetime.

Removing permitted development rights

3.4.47 Where development could result in a loss of flood plain storage capacity or impede flow permitted development rights will be removed from all new developments and individual properties within Flood Zone 3, in order to ensure the risk of flooding is not increased through unregulated development.

²⁶ Non-statutory Technical Standards - <https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards>
Supporting guidance - <http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/>

Appendix 1 – Vulnerability Classifications

Vulnerability Classification	Development Uses
Essential Infrastructure	<ul style="list-style-type: none"> • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable	<ul style="list-style-type: none"> • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”).
More Vulnerable	<ul style="list-style-type: none"> • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	<ul style="list-style-type: none"> • Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non–residential institutions not included in “more vulnerable”, and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).



Vulnerability Classification	Development Uses
Water-Compatible Development	<ul style="list-style-type: none"> • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Source- National Planning Policy Framework



Appendix 2 – ‘Developed’ areas within 1 in 20 year flood outline

The approach to development in these areas recognises the importance of pragmatic planning solutions that will not unnecessarily ‘blight’ areas of existing development, the significance of the undeveloped land around them and the potential opportunities to reinstate areas which can operate as Functional Floodplain through re-development to provide space for floodwater and reduce risk to new and existing development.

Where redevelopment is proposed in these areas schemes should not increase the vulnerability classification of the site. All schemes must result in a net reduction in flood risk and ensure that floodplain storage and flow routes are not affected. This can be achieved through a combination of on and off-site measures.

- Reducing the land use vulnerability;
- Seeking opportunities to ensure there is no increase or achieve a reduction in the number of people at risk (e.g. avoiding conversions and rebuilds of properties that result in an increase in the number of residential dwellings);
- Maintaining or reducing built footprint;
- Removing non-floodable structures;
- Raising finished floor levels;
- Reducing surface water runoff rates and volumes from the site;
- Increasing floodplain storage capacity through the provision of direct/indirect floodplain compensation and voids;
- Reducing impedance to floodwater flow and restoring flood flow paths;
- Incorporating flood resilient and/or resistance measures; and
- Ensuring development remains safe for users in time of flood (this may refer to the timely evacuation of properties prior to the onset of flooding in accordance with an individual Flood Warning and Evacuation Plan for the site).

Proposals for a change of use or conversion to a higher vulnerability classification will not be permitted. Basements, basement extensions, conversions of basements to a higher vulnerability classification will not be permitted.

These areas are particularly sensitive to the cumulative impact of minor development and therefore the Council will require such proposals to consider, in detail, the flood risk implications of the development. Proposals for **Small scale development** in these areas should not increase flood risk elsewhere by not impeding flow or reducing storage capacity. This could be achieved for example by ensuring that flow routes are not hindered by buildings, providing direct or indirect flood compensation storage or the incorporation of voids under raised floor levels. Whilst it is acknowledged that full compensation may not be possible on all minor developments, an applicant must be able to demonstrate that every effort has been made to achieve this and provide full justification where this is not the case.

In these areas, the Council will consider making Article 4 Directions in future to remove permitted development rights and ensure that flood risk can be fully assessed through the planning application process

Appendix 3 – Flood Risk Assessment Proforma



Flood Risk Assessment Proforma

Please note: Not all elements of this Proforma will need to be completed for all developments. The level and scope of the FRA will depend on the degree and type of flood risk, scale and nature of the development, its vulnerability classification and whether or not the Sequential and Exceptions Tests are required. Applicants should use Flood Risk SPD to scope out the requirements and are strongly encouraged to use the pre-applications services available (Section 2.1). **The completion of a FRA will not automatically mean that the development is acceptable in flood risk terms.**

1. Site Description

What to Include in the FRA		Source(s) of information	Summary	Reference to Section of FRA
Site address	-	-		
Site description	-	-		
Location Plan	Including geographical features, street names, catchment areas, watercourses and other bodies of water	SFRA Appendix B		
Site plan	Plan of site showing development proposals and any structures which may influence local hydraulics e.g. bridges, pipes/ducts	OS Mapping		

	crossing watercourses, culverts, screens, embankments, walls, outfalls and condition of channel			
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2. Proposed Development

What to Include in the FRA		Source(s) of information	Summary	Reference to Section of FRA
Vulnerability Classification	Determine the vulnerability classification of the development. Is the vulnerability classification appropriate within the Flood Zone?	SPD Appendix 1		

3. Assessing Flood Risk

What to Include in the FRA		Source(s) of information	Summary	Reference to Section of FRA
The level of assessment will depend on the degree of flood risk and the scale, nature and location of the proposed development. Refer to Table 7-1 of the SFRA regarding the levels of assessment. Not all of the prompts listed below will be relevant for every application.				
Topography	Include general description of the topography local to the site. Where necessary, site survey may be required to confirm site levels (in relation to Ordnance datum).	Topography		
Landscape and Vegetation	Include a description of the landscape and existing vegetation on the site.	SPD Section 3.1		
Geology	General description of geology local to the site.	SPD Section 3.1		

Watercourses	Identify Main Rivers and Ordinary Watercourses local to the site.	SPD Section 3.2		
Flooding from Rivers	<p>Provide a plan of the site and Flood Zones.</p> <p>Identify any historic flooding that has affected the site, including dates and depths where possible.</p> <p>How is the site likely to be affected by climate change?</p> <p>Determine flood levels on the site for the 1% annual probability (1 in 100 chance each year) flood event including an allowance for climate change.</p> <p>Determine flood hazard on the site (in terms of flood depth and velocity).</p> <p>Undertake new hydraulic modelling to determine the flood level, depth, velocity, hazard, rate of onset of flooding on the site.</p>	<p>SPD Section 3.2</p> <p>SFRA Appendix C</p> <p>Environment Agency Products 1-7.</p> <p>New hydraulic model.</p>		
Flooding from Land	Identify any historic flooding that has affected the site.	<p>SPD Section 3.2</p> <p>SFRA Appendix D.</p> <p>Topographic survey.</p> <p>Site walkover.</p> <p>New modelling study.</p>		
Flooding from	Desk based assessment	SPD Section 3.2		

Groundwater	based on high level BGS mapping in the SFRA.	SFRA Appendix B, Figure B2, B3, B5. Ground Investigation Report Hydrology Report		
Flooding from Sewers	Identify any historic flooding that has affected the site.	SPD Section 3.2 SFRA Appendix B Figures B7 and B8. Where appropriate an asset location survey can be provided by Thames Water Utilities Ltd http://www.thameswater-propertysearches.co.uk/		
Reservoirs, canals and other artificial sources	Identify any historic flooding that has affected the site.	SPD Section 3.2 Risk of Flooding from Reservoirs mapping (EA website).		

This form is completed using factual information and can be used as a summary of the Flood Risk Assessment on this site.

Form Completed By.....

Qualification of person responsible for signing off this pro-forma

Company.....,

On behalf of (Client's details)

Date:.....

Appendix 4 – Flood Risk Assessment small scale development Template



Flood Risk Assessment Small Scale Development Template

Please note: The following template provides applicants for small scale development a broad overview on the information what would be expected to be contained within a completed FRA. Applicants should use the Flood Risk SPD to scope out the requirements and are strongly encouraged to use the pre-applications services available (Section 2.1). **The completion of a FRA will not automatically mean that the development is acceptable in flood risk terms.**

Site information	
Notes: Refer to Section 3.1 Parts 1 & 2 of FRA	
This section should describe the site in its current state. It should include a location map which clearly indicates the development site boundary, features, watercourses and other bodies of water as well as any structures which may influence the flow of water	
Example: The proposed development site is located at [insert address] and is currently [insert existing use here, i.e. vacant, housing, shops etc.]	

Looking over the lifetime of the proposed development, the site lies within [delete as appropriate: Flood Zone 3b/ 3a /2 /1 and/ or an area risk at other sources of flooding and/ or is larger than 1 hectare in area] and therefore a Flood Risk Assessment is required.

Proposed development

Notes: Refer to Section 3.1 of the SPD

This section should describe the development proposals. It should include/ make reference to an existing block plan and a proposed block plan.

Example: The development proposal(s) for the above site are [enter a description of the proposals here]. The proposed development is therefore classified as [insert flood risk vulnerability classification here- Appendix 1 of the Flood Risk SPD or Table 2 of the Planning Practice Guidance].

The lifetime of the proposed development is assumed to be [Delete as appropriate: 100 years (residential) / 60 years (commercial)].

Assessing flood risk

Notes: The level of assessment will depend on the degree of flood risk and the scale, nature and location of the proposed development. Refer to Section 3.2 of the SPD and Table 7-1 of the SFRA regarding the levels of assessment. Not all of the prompts listed below will be relevant for every application.

This section should describe the site specific flood hazards from all potential sources of flooding over the lifetime of the proposed development. It should include any evidence, such as maps showing the site with Flood Zones, any modelling data (depths and / or velocities), and relevant data from the Elmbridge SFRA.

Managing and mitigating flood risk

Notes: Refer to Section 3.2 of the SPD. Section 4 of the SFRA presents measures to manage and mitigate flood risk and when they should be implemented.

This section should answer the following questions;

- How will you ensure that the proposed development is safe for its lifetime?
- How will you ensure that the proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere?
- Are there any opportunities offered by the development to reduce flood risk elsewhere?
- What flood-related risks will remain after you have implemented the measures to protect the site from flooding (i.e. residual risk) and how and by whom will these be managed over the lifetime of the development (e.g. flood warning and evacuation procedures)?

Managing and mitigating flood risk

This section should include a summary of all significant points previously identified in relation to the flood hazard, including how it can be managed.

This form is completed using factual information and can be used as a Flood Risk Assessment on this site.

Form Completed By.....

Qualification of person responsible for signing off this template.....

Company.....,

On behalf of (Client's details)

Date:.....

Appendix 5- Glossary

Term	Definition
1D Hydraulic Model	Hydraulic model which computes flow in a single dimension, suitable for representing systems with a defined flow direction such as river channels, pipes and culverts
2D Hydraulic Model	Hydraulic model which computes flow in multiple dimensions, suitable for representing systems without a defined flow direction including topographic surfaces such as floodplains
Asset Information Management System (AIMS)	Environment Agency database of assets associated with Main Rivers including defences, structures and channel types. Information regarding location, standard of service, dimensions and condition.
Attenuation	In the context of this report - the storing of water to reduce peak discharge of water.
Catchment Flood Management Plan	A high-level plan through which the Environment Agency works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk.
Climate Change	Long term variations in global temperature and weather patterns caused by natural and human actions. For fluvial events a 20% increase in river flow is applied and for rainfall events, a 30% increase. These climate change values are based upon information within the NPPF and Planning Practice Guidance.
Culvert	A channel or pipe that carries water below the level of the ground.
DG5 Register	A water-company held register of reported sewer flooding due to hydraulic overload, or properties which are 'at risk' of sewer flooding more frequently than once in 20 years.
Exception Test	The exception test should be applied following the application of the sequential test. Conditions need to be met before the exception test can be applied.
Flood Defence	Infrastructure used to protect an area against floods, such as floodwalls and embankments; they are designed to a specific standard of protection (design standard).
Flood Resilience	Measures that minimise water ingress and promotes fast drying and easy cleaning, to prevent any permanent damage.
Flood Resistance	Measures to prevent flood water entering a building or damaging its fabric. This has the same meaning as flood proof.
Flood Risk	The level of flood risk is the product of the frequency or likelihood of the flood events and their consequences (such as loss, damage, harm, distress and disruption).
Flood Zone	Flood Zones show the probability of flooding, ignoring the presence of existing defences

Term	Definition
Functional Floodplain	Land where water has to flow or be stored in times of flood.
Groundwater	Water that is in the ground, this is usually referring to water in the saturated zone below the water table.
Lead Local Flood Authority (LLFA)	As defined by the Flood and Water Management Act, in relation to an area in England, this means the unitary authority or where there is no unitary authority, the county council for the area, in this case Surrey County Council.
Light Detection and Ranging (LiDAR)	Airborne ground survey mapping technique, which uses a laser to measure the distance between the aircraft and the ground.
Local Planning Authority (LPA)	Body that is responsible for controlling planning and development through the planning system.
Main River	Watercourse defined on a 'Main River Map' designated by Defra. The Environment Agency has permissive powers to carry out flood defence works, maintenance and operational activities for Main Rivers only.
Mitigation measures	An element of development design which may be used to manage flood risk or avoid an increase in flood risk elsewhere.
Ordinary Watercourse	A watercourse that does not form part of a Main River. This includes "all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows" according to the Land Drainage Act 1991.
Ramsar Site	Wetlands of international importance, designated under the Ramsar Convention
Residual Flood Risk	The remaining flood risk after risk reduction measures have been taken into account.
Sequential Test	Aims to steer vulnerable development to areas of lowest flood risk.
Sewer Flooding	Flooding caused by a blockage or overflowing in a sewer or urban drainage system.
Surface Water	Flooding caused when intense rainfall exceeds the capacity of the drainage systems or when, during prolonged periods of wet weather, the soil is so saturated such that it cannot accept any more water.
Sustainable drainage systems (SuDS)	Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques.
Topographic survey	A survey of ground levels.