Level 2 Strategic Flood Risk Assessment

Spelthorne Borough Council

Level 2 Report

Project Number 60559796

July 2022

Quality information

Prepared by	Checked by	Verified by	Approved by
Lauren Lewis Water Consulting Apprentice Sarah Littlewood Principal Consultant	Bernadine Maguire Principal Consultant	Emily Craven Associate Director	Sarah Littlewood Principal Consultant

Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	16/03/2021	Draft report for comment	EC	Emily Craven	Associate Director
2	05/05/2022	Updated with reference to latest peak river flow climate change allowances	SL	Sarah Littlewood	Principal Consultant
3	20/07/2022	Updated with final list of allocated sites.	SL	Sarah Littlewood	Principal Consultant
4	22/07/2022	Minor edits to list of sites	SL	Sarah Littlewood	Principal Consultant

Prepared for:

Spelthorne Borough Council

Prepared by:

AECOM Infrastructure and Environment UK Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

Table of Contents

Tables

1. Introduction

1.1 Project Background

1.1.1 The National Planning Policy Framework[1] (NPPF) and associated Planning Practice Guidance (PPG) for Flood Risk and Coastal Change[2] set out the active role Local Planning Authorities (LPAs) should take to ensure that flood risk is understood and managed effectively and sustainably throughout all stages of the planning process. The NPPF outlines that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and LPAs should use the findings to inform strategic land use planning. The overall approach of the NPPF to flood risk is broadly summarised in Paragraph 163:

"When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
b) the development is appropriately flood resistant and resilient;
c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
d) any residual risk can be safely managed; and
e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan".

1.1.2 Spelthorne Borough Council (BC) is currently working on an emerging Local Plan which contains the overall vision and framework for future development in the area, addressing needs and opportunities in relation to housing, the economy, community facilities and infrastructure, as well as providing a basis for conserving and enhancing the natural and historic environment, mitigating and adapting to climate change, and achieving well designed places. The emerging Local Plan will set out how the local area will develop over at least the next 15 years and once adopted, will replace the 2009 Development Plan.

1.1.3 AECOM has been commissioned by Spelthorne BC to prepare a Level 1 and Level 2 SFRA to inform the ongoing preparation of the emerging Local Plan. This report and associated appendices form the Level 2 SFRA for Spelthorne Borough.

1.2 Level 1 SFRA

1.2.1 A Level 1 SFRA report has been prepared for Spelthorne BC[3]. The purpose of the Level 1 SFRA is to collate and analyse the most up to date readily available flood risk information for all sources of flooding and provide an overview of flood risk issues across the Borough.

1.2.2 The Level 1 SFRA provides guidance on:

- The application of the Sequential Test by the LPA when allocating future development sites to inform their Local Plan, as well as by developers promoting development on windfall sites.
- Managing and mitigating flood risk, the application of sustainable drainage systems (SuDS), and the preparation of site-specific Flood Risk Assessments (FRAs).
- Potential flood risk management objectives and policy considerations which may be developed and adopted by Spelthorne BC as formal policies within their emerging Local Plan.

1.2.3 Using the strategic flood risk information presented within the Level 1 SFRA, Spelthorne BC can undertake the Sequential Test which is the decision-making process whereby future development is steered towards areas of lowest flood risk.

[1] Department for Communities and Local Government. 2012. *National Planning Policy Framework*. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2
[2] Department for Communities and Local Government. 2014. *Planning Practice Guidance: Flood Risk and Coastal Change.* Available at: http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
[3] AECOM, March 2021 Spelthorne Borough Council Level 1 Strategic Flood Risk Assessment.

1.3 Level 2 SFRA

1.3.1 The PPG states that where a Level 1 SFRA shows that land outside flood risk areas cannot appropriately accommodate all the necessary development, it may be necessary to increase the scope of the SFRA to a Level 2 to provide the information necessary for application of the Exception Test where appropriate. A Level 2 SFRA should consider the detailed nature of the flood characteristics within a flood zone including, where possible;

- flood probability;
- flood depth;
- flood velocity;
- rate of onset of flooding; and
- duration of flood

1.3.2 The Level 2 SFRA provides more detailed information about the flood risks in the Borough. This will enable users to:

- apply the sequential test by identifying the severity and variation in risk within medium and high flood risk areas;
- establish whether proposed allocations or windfall sites, on which the emerging Local Plan will rely, are capable of being made safe throughout their lifetime without increasing flood risk elsewhere; and
- apply the exception test, where relevant.

1.3.3 Appendix A provides borough wide mapping of flood risk datasets to enable comparison of the flood risks across the study area.

1.3.4 Appendix B provides site assessment sheets for specific sites that may be proposed for allocation within the emerging Local Plan.

Exception Test

1.3.5 The purpose of the Exception Test is to ensure that, where it may be necessary to locate development in areas at risk of flooding, new development is only permitted in Flood Zone 2 and Flood Zone 3 where the flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime, considering climate change. Table 1-1 identifies when the Exception Test is required. Full details of the vulnerability classifications for different types of development can be found in the Level 1 SFRA and in Table 2[4] of the PPG (Flood Risk and Coastal Change).

Table 1-1 Flood risk vulnerability and Flood Zone 'compatibility' (PPG, 2014)

Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	1	✓	✓	✓	✓	✓
	2	✓	✓	Exception Test Required	✓	✓
	3a	Exception Test Required	✓	×	Exception Test Required	✓
	3b	Exception Test Required	✓	×	×	×

✓ - Development is appropriate × - Development should not be permitted

[4] Flood risk and coastal change - GOV.UK (www.gov.uk)

1.3.6 The NPPF states that for the Exception Test to be passed it must be demonstrated that:

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

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

1.3.7 Both elements of the test will have to be passed for development to be permitted.

1.3.8 In order to determine Part A of the Exception Test, applicants should assess their scheme against the objectives set out in the Spelthorne BC Sustainability Appraisal[5]. In order to demonstrate satisfaction of Part B of the Exception Test, relevant flood risk management and mitigation measures should be applied and demonstrated within a site-specific flood risk assessment (FRA). Chapter 5 'Managing and Mitigating Flood Risk' and Chapter 6 'Preparing Site Specific Flood Risk Assessments (FRAs)' within the Level 1 SFRA should be referred to in order to support Part B of the Exception Test.

1.4 Site Screening

1.4.1 A number of factors are influencing the spatial strategy in Spelthorne Borough and there is still a large pool of sites under consideration within the emerging Local Plan.

1.4.2 A list was provided to AECOM on 25th November 2020, of all potential development sites identified by Spelthorne BC at that time. This comprises 149 potential development sites. Of these sites, 65 have been identified as likely to be allocated, and 84 are not currently likely to be allocated.

1.4.3 As part of this Level 2 SFRA, AECOM have undertaken a screening exercise for all the sites against the available flood risk datasets, to identify the main sources of flood risk to each site. The database has been made available to Spelthorne BC.

1.4.4 Of the 65 sites that are marked as potential allocation sites, 18 sites entail proposals for More Vulnerable residential development that are either partially or wholly within Flood Zone 3a. In accordance with Table 1-1, these proposals will require the application of the Exception Test and have therefore been included for assessment as part of this Level 2 SFRA.

1.4.5 A further 9 sites have also been identified for assessment as part of this Level 2 SFRA. These sites propose development in Flood Zone 2 where the Exception Test is not required. However, in the future as a result of climate change, the site is shown to be at increased risk of flooding from rivers, and therefore a site assessment has been undertaken as part of the Level 2 SFRA.

1.5 Consultation

1.5.1 Datasets have been provided by the Environment Agency and Surrey County Council in their role as the Lead Local Flood Authority, to inform the development of the Level 2 SFRA. The draft report has been circulated for review and further input by the stakeholders.

[5] Spelthorne Borough Council (February 2021) Spelthorne Local Plan Preferred Options Consultation Sustainability Appraisal Final Report. Available from: https://www.spelthorne.gov.uk/article/19901/Preferred-Options-Consultation-documents

1.6 Future Updates to the SFRA

1.6.1 SFRAs are intended to be living documents, that are kept up to date as information on flood risk management changes. The Environment Agency SFRA guidance available online[6] states that in order to remain up to date, it is necessary to update a SFRA to incorporate any changes to:

- the predicted impacts of climate change on flood risk;
- detailed flood modelling - such as from the Environment Agency or lead local flood authority;
- the local plan, spatial development strategy or relevant local development documents;
- local flood management schemes;
- flood risk management plans;
- local flood risk management strategies;
- national planning policy or guidance.

1.6.2 The SFRA should also be reviewed after a significant flood event.

[6] https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment

2. Datasets

2.1 Overview

2.1.1 The following datasets and sources of information have been obtained to inform the Level 2 SFRA.

2.2 River Modelling Outputs

2.2.1 As part of the Environment Agency's national programme of coastal and fluvial modelling studies, hydraulic models have been developed for the Main Rivers in the Borough including the River Thames, River Ash, Sweep's Ditch, Pool End Ditch and River Colne. These are described in turn in the subsections below, along with a summary of the outputs that has been used to inform the Level 2 SFRA site assessments.

2.2.2 The Environment Agency's online guidance 'Flood risk assessments: climate change allowances[7]' sets out the climate change allowances for peak river flows by management catchment. Management catchments are sub-catchments of river basin districts. The management catchments of relevance to the Spelthorne study area are described in in Table 2-1. The allowances that have been used within this Level 2 SFRA are also detailed in the subsections below.

Table 2-1 Peak river flow allowances for management catchments in Spelthorne (use 1961 to 1990 baseline)

Management Catchment	Allowance category	Total potential change anticipated for '2020s' (2015 to 2039)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
London Management	Upper end (95th)	26%	30%	54%
	Higher central (70th)	14%	14%	27%
	Central (50th)	10%	7%	17%
Colne Management	Upper end (95th)	30%	38%	72%
	Higher central (70th)	16%	16%	35%
	Central (50th)	10%	8%	21%
Maidenhead and Sunbury Management	Upper end (95th)	32%	45%	81%
	Higher central (70th)	19%	25%	47%
	Central (50th)	14%	17%	35%

River Thames

2.2.3 As part of the Lower Thames, Jubilee River and River Ash Modelling Study[8], a 1D-2D model was developed to provide high resolution floodplain mapping of the Lower Thames catchment between Marlow and Hammersmith as well as enabling the impact of the proposed River Thames Scheme (RTS) updates to be tested and the economic impacts to be quantified in more detail.

[7] Environment Agency (published 2016 and updated May 2022) Flood risk assessments: climate change allowances. https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[8] Lower Thames, Jubilee River and River Ash Modelling Study, JBA Consulting, July 2020.

2.2.4 Flood maps have been developed for events where the River Thames represents the main source of flooding (Thames dominated) and conversely when the tributaries are the key source of flooding (Tributary dominated).

2.2.5 The following scenarios were undertaken:

- Defended scenarios for the following Annual Exceedance Probability (AEP) events: 50%, 20%, 10%, 5%, 3.33%, 2.5%, 2%, 1.33%, 1%, 0.5%, 0.1%.
- Climate change scenarios: 15%, 25%, 35% and 70% increase in peak flows applied to the 1% AEP modelled event. For areas in the London management catchment these modelled outputs provide good coverage for the central allowance (17%) and higher central allowance (27%). For areas in the Maidenhead and Sunbury management catchment, the 35% allowance is suitable for the central allowance (35%) and the 70% allowance could be used as a conservative outline for the higher central (47%).
- Undefended scenarios for the 1% and 0.1% AEP events (to inform the development of Flood Zones 3 and 2 respectively on the Flood Map for Planning (Rivers and Sea)).

2.2.6 The following outputs were produced from the modelling: maximum flood extent, maximum depth grid, maximum velocity, maximum hazard rating, maximum water level.

2.2.7 Maps showing the maximum flood depths and hazard ratings for the 1% AEP including 35% allowance for climate change are included in **Appendix A Figure 1 and 2 (Thames dominated flooding),** and **Appendix A Figure 3 and 4 (Tributary dominated flooding)**, and the site proformas (Appendix B) where required.

2.2.8 It is noted that information on the rate of onset of flooding and the duration of flooding has not been made available from these datasets.

2.2.9 Flood 'hazard' categorises the danger to people for different combinations of flood water depth and velocity. The derivation of these categories is based on the methodology set out by Defra in Flood Risks Assessment Guidance for New Development FD2320/TR2[9] using the following equation:

*Flood Hazard Rating = ((v+0.5)*D) + DF Where v = velocity (m/s), D = depth (m), DF = debris factor*

Flood Hazard		Description
Low	HR < 0.75	Caution – Flood zone with shallow flowing water or deep standing water
Moderate	0.75 ≥ HR ≤ 1.25	Dangerous for some (i.e. children) – Danger: flood zone with deep or fast flowing water
Significant	1.25 > HR ≤ 2.0	Dangerous for most people – Danger: flood zone with deep fast flowing water
Extreme	HR > 2.0	Dangerous for all – Extreme danger: flood zone with deep fast flowing water

River Ash

2.2.10 The River Ash Modelling Update[10] was completed in 2019 and forms part of the wider-arching Lower Thames, Jubilee River and River Ash Modelling study (JBA July 2020), examining river flood risk along two particular tributaries of the River Thames:

- The River Ash, a tributary of the River Colne in Staines-Upon-Thames; and
- Staines Aqueduct, a man-made channel mainly used for water supply purposes by Thames Water.

2.2.11 The following scenarios were undertaken:

- Defended scenarios for the following AEP events: 50%, 20%, 10%, 5%, 3.33%, 2.5%, 2%, 1.33%, 1%, 0.5%, 0.1%.

[9] Defra and Environment Agency (2005) FD2320/TR2 Flood Risk Assessment Guidance for New Development.
[10] JBA Consulting, 2019, River Ash Modelling Update.

- Climate change scenarios: 15%, 25%, 35% and 70% increase in peak flows applied to the 1% AEP modelled event. For areas in the London management catchment these modelled outputs provide good coverage for the central allowance (17%) and higher central allowance (27%).
- Undefended scenarios for the 1% and 0.1% AEP events (to inform the development of Flood Zones 3 and 2 respectively on the Flood Map for Planning (Rivers and Sea)).

2.2.12 The following outputs were produced from the modelling: maximum flood extent, maximum depth grid, maximum velocity, maximum hazard rating, maximum water level.

2.2.13 Maps showing the maximum flood depths and hazard ratings for the 1% AEP including 35% allowance for climate change are included in **Appendix A Figure 5 and 6**, and the site proformas in Appendix B where required.

2.2.14 It is noted that information on the rate of onset of flooding and the duration of flooding has not been made available from these datasets.

River Colne Modelling

2.2.15 Modelling of the River Colne was supplied by the Environment Agency from the Lower Colne Modelling and Mapping Study[11]. The model is a 1D-2D linked model. The section within the Spelthorne Borough is solely in 1D.

2.2.16 The following scenarios were undertaken:

- Defended scenarios for the following AEP events: 50%, 20%, 10%, 5%, 2%, 1% and 0.1%.
- Climate change scenarios: 20% increase in peak flows applied to the 1% AEP modelled event.
- Undefended scenarios for the 1% and 0.1% AEP events (to inform the development of Flood Zones 3 and 2 respectively on the Flood Map for Planning (Rivers and Sea)).

2.2.17 The following outputs were produced from the modelling: maximum flood extent, maximum depth grid, maximum velocity, maximum hazard rating, maximum water level. However, it is noted that hazard and velocity outputs are only available for those sections of the model in 2D, and it is therefore not available for the Spelthorne Borough.

2.2.18 Within this study, climate change was considered for the 1% AEP event by increasing peak flows in the hydrological boundaries by 20% in accordance with the Environment Agency guidance 2011 and UKCIP09. Modelling results for the full suite of new allowances, as set out in Table 2-1, are therefore not currently available. It is not currently within the scope of this SFRA to re-run the River Colne model to account for the new climate change allowances. It is therefore proposed to use the 1 in 1000 year outline as a proxy for the climate change outline within this Level 2 SFRA.

2.2.19 **Appendix A Figure 7** shows the maximum flood depth map for the 0.1% AEP modelled event. This is included in the site proformas in Appendix B, where required.

2.3 Risk of Flooding from Surface Water

Flood Extents

2.3.1 The outputs of the Environment Agency's Risk of Flooding from Surface Water (RoFSW) mapping include GIS layers showing the extent of flooding from surface water that could result from a flood with a 3.33%, 1% and 0.1% chance of happening in any given year.

2.3.2 It is noted that the Risk of Flooding from Surface Water is not to be used at property level. Because of the way they have been produced and the fact that they are indicative, the maps are not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to flooding at any scale without further supporting studies or evidence. However, the mapping provides a useful source of information to identify the risk of surface water flooding to the wider area in which a site is located, and the general patterns of surface water flow and ponding.

[11] Mott MacDonald, April 2012, Lower Colne Modelling and Mapping Study.

2.3.3 Mapping for the whole study area is included in the Level 1 SFRA, Appendix B Figures 11A-11D.

2.4 Groundwater Flooding

Areas Susceptible to Groundwater Flooding

2.4.1 Areas Susceptible to Groundwater Flooding (AStGWF) is an Environment Agency dataset included within the Level 1 SFRA[3]. It is a strategic scale map showing where groundwater flooding could occur. It shows the proportion of each 1km grid square where geological and hydrogeological conditions indicate that groundwater might emerge.

2.4.2 The susceptible areas are represented by one of four categories showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.

- <25%
- >=25%<50%
- >=50%<75%
- >=75%

2.4.3 The absence of values for any grid square means that no part of that square is identified as being susceptible to groundwater emergence. The map identifies areas where further investigation is needed to assess whether groundwater flooding may affect property or infrastructure.

2.4.4 Mapping for the whole study area is included in the Level 1 SFRA, Appendix B Figure 12.

BGS Susceptibility to Groundwater Flooding

2.4.5 The British Geological Survey (BGS) dataset 'Susceptibility to Groundwater Flooding' is mapped within the Surrey County Council Local Flood Risk Management Strategy[12] (LFRMS) and has been referred to within the Level 2 SFRA.

2.4.6 The information shown in the Susceptibility to Groundwater Flooding mapping is based on conceptual understanding of the regional geology and hydrogeology and is therefore only an indication of where groundwater flooding may occur. It does not indicate hazard or risk, any information on the depth to which groundwater flooding may occur, nor the likelihood of the occurrence of an event of a particular magnitude. This information should not be used in isolation to make planning decisions at any scale or to indicate the risk of groundwater flooding, but it does provide a high level overview of the potential for groundwater flooding. The map shows the following information:

- **Limited potential for groundwater flooding to occur**: In this area there is a limited potential, based on an understanding of the underlying geology and hydrogeological conditions, that groundwater flooding may occur.
- **Potential for groundwater flooding of property situated below ground level**: In this area there is the potential, based on an understanding of the underlying geology and hydrogeological conditions, that groundwater flooding may occur in property or infrastructure below ground level, such as basements.
- **Potential for groundwater flooding to occur at surface**: In this area there is the potential, based on an understanding of the underlying geology and hydrogeological conditions, that groundwater flooding may occur above the ground.

2.4.7 All other areas are not considered to be prone to groundwater flooding.

[12] Surrey County Council, 2017, Local Flood Risk Management Strategy Refresh. https://www.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/surrey-local-flood-risk-management-strategy

2.5 Reservoir Flooding

2.5.1 The Environment Agency Long Term Flood Risk Map[13] identifies those areas that could flood in the unlikely event that a reservoir failed.

2.5.2 The likelihood of reservoir flooding is much lower than other forms of flooding. Current reservoir regulation, which has been further enhanced by the Flood and Water Management Act, aims to make sure that all reservoirs are properly maintained and monitored in order to detect and repair any problem[14].

2.6 Historic Flood Records

Recorded Flood Outlines

2.6.1 The Borough has a history of significant flooding events, specifically from the River Thames, with major events occurring in 1894, six between 1900 and 1929, 1947, 1959, 1974, 2003 2009, 2012 and 2013/2014. The Environment Agency dataset 'Recorded Flood Outlines' has been used to inform the Level 2 SFRA site assessments.

Lead Local Flood Authority Records

2.6.2 In their role as the LLFA, SCC has duties to record and investigate flood incidents relating to local sources of flooding, namely flooding from surface water, groundwater and ordinary watercourses. SCC has provided a number of GIS layers to inform the Level 1 SFRA that relate to past flood events. These datasets are presented spatially in the Level 1 SFRA Appendix A Figures 11A-11D.

2.6.3 A summary of each dataset as provided below:

- **Internal property flooding**: road locations along which internal property flooding has been reported to SCC.
- **External property flooding**: road locations along which external property flooding has been reported to SCC.
- **Historical Flooding Incidents**: indicative road location along which a flood event has occurred that has been investigated by SCC and a Section 19 Flood Investigation Report has been prepared.
- **SCC Wetspots**: 'Wetspot' is a term used by SCC as the LLFA to describe the location of a surface water flooding incident that has been reported. The wetspot database is continually updated to produce a comprehensive map and record of all the identified wetspots in Surrey. Information from Surrey risk management authorities informs the database. SCC currently prioritises capital works at wetspots throughout the county based on a number of factors. These factors include safety, internal property flooding, social impact and duration of flooding. Details of these specific factors have not been supplied for the purposes of the SFRA.

2.6.4 An updated version of the SCC wetspot dataset was provided in December 2021 for use within this Level 2 SFRA site assessments.

Sewer Flooding Records

2.6.5 Thames Water provided an extract from their register of flooded properties for the study area to inform the Level 1 SFRA. This shows properties that have been affected by sewer flooding (as reported to Thames Water) within the last 20 years. Due to data protection requirements, this data has not been provided at the individual property level; rather the register comprises the number of properties within 4 digit postcode areas that have experienced flooding, either internally or externally, over the last 20 years. It should be noted that it is likely that there have also been unreported sewer flooding incidents in this area over this time period.

2.6.6 This data has also been referred to within the Level 2 SFRA site assessments.

[13] https://flood-warning-information.service.gov.uk/long-term-flood-risk/map
[14] https://www.gov.uk/government/news/reservoir-flood-maps-published

3. Level 2 SFRA Site Assessments

3.1 Sites for assessment

Site Allocations

3.1.1 The following site allocations comprise More Vulnerable residential development on sites that are either partially or wholly within Flood Zone 3a (1% AEP of river flooding in the present day). In accordance with Table 1-1, these proposals will require the application of the Exception Test:

- AT/012 Ashford Community Centre, Woodthorpe Road
- RL1/011 Land at Staines and Laleham Sports Club, Worple Road, TW18 1HR
- ST1/028 Leacroft Centre, Leacroft, TW18 4PB
- ST1/029 Surrey CC Buildings, Burges Way, TW18
- ST1/030 Fairways Day Centre, Knowle Green, TW18 1AJ
- ST1/037 Thameside House, South Street, TW18 4PR
- ST3/012 Staines Telephone Exchange, Fairfield Avenue, TW18 4AB
- ST4/002 Car Park, Hanover House and Sea Cadet Building, Bridge Street, TW18 4TG
- ST4/009 The Elmsleigh Centre and adjoining land, South Street, TW18 4QF
- ST4/010 Riverside Surface Carpark, Thames Street, TW18 4UD
- ST4/011 Thames Lodge, Thames Street, TW18 4SJ

3.1.2 The following site allocations propose development in Flood Zone 2 (0.1% AEP of river flooding in the present day). The Exception Test is not required, however, in the future as a result of climate change, the sites are shown to be at increased risk of flooding from rivers (1% AEP), and therefore site assessments have been undertaken as part of the Level 2 SFRA to determine any potential constraints.

- SH1/015 Shepperton Youth Centre, Laleham Road, TW17 8EJ
- ST1/031 Thameside Arts Centre, Wyatt Road, TW18 2AY
- ST3/004 34-36 (OAST House) /Car park, Kingston Road, TW18 4LN
- ST3/014 Birch House/London Road, Fairfield Avenue
- ST4/001 Jewsons, Moor Lane, TW18 4YN
- ST4/004 96-104, Church Street, TW18 4DQ
- ST4/019 Debenhams site, 35-45, High Street, TW18 4QU

3.2 Proforma template

Site assessment proformas for sites are included in Appendix B. Table 3-1 provides an overview of the fields in the proforma and the source of the information or dataset.

Table 3-1 Datasets and information used for Level 2 Site Proformas

Proforma Field	Dataset / information used
Site Description	
Site Name and ID	As provided by Spelthorne BC (Excel sheet and GIS layer of sites).
Area (ha)	The area of the site (hectares).
Proposed use	As provided by Spelthorne BC. **Where this was not specified, mixed-use including residential has been assumed to provide a conservative assessment of the site.**
Vulnerability classification	Defined in accordance with PPG Flood Risk and Coastal Change Table 1.
Flood Zone and Historic Flooding	
Proportion within each Flood Zone and Areas Benefitting from Defences	Flood Map for Planning (Rivers and Sea) Flood Zone 2; Flood Map for Planning (Rivers and Sea) Flood Zone 3; Flood Map for Planning (Rivers and Sea) Areas Benefitting from Defences; Level 1 SFRA Flood Zone 3b Functional Floodplain outline.
Flood Warning Area	Environment Agency Flood Warning Areas.
Recorded River Flooding Outlines in which the site is located	The dates of the flood events that have affected the site, as detailed in the Environment Agency 'Recorded Flood Outlines' dataset and mapped in Level 1 SFRA Appendix B Figures 9A and 9B .
Number of flood records within 500m of the site, (road locations along which there have been reported incidents of flooding from surface water, groundwater or ordinary watercourses):	The number of historic records of flooding from surface water, groundwater or ordinary watercourses within 500m of the site, as detailed in datasets provided by Surrey County Council for the Level 1 SFRA described in Section 2.6 of this report, and the SCC Wetspots dataset supplied on 1st December 2020. These datasets are all supplied as roads along which flood incidents have been recorded rather than individual properties or point locations.
Sewer flooding records within the post code area in which the site is located:	As provided by Thames Water for the Level 1 SFRA and described in Section 3.5 of the Level 1 SFRA Report.
River Flooding	
Maximum Flood Depth Map	Maximum flood depth map(s) for the watercourses relevant to the site (River Thames / Thames Tributaries / River Ash / River Colne), as described in Section 2.2.
Maximum Flood Hazard Map	Maximum flood hazard map(s) for the watercourses relevant to the site (River Thames / Thames Tributaries / River Ash), as described in Section 2.2.
Surface Water Flooding	
Risk of Flooding from Surface Water Map	Environment Agency dataset. Obtained February 2021.
Groundwater Flooding	
Bedrock Geology	Bedrock geology underlying the site, based on BGS mapping.
Superficial Geology	Superficial geology underlying the site, based on BGS mapping.
Areas Susceptible to Groundwater Flooding	The susceptible areas are represented by one of four categories showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.
BGS Susceptibility for Groundwater Flooding	A BGS dataset mapped within the Surrey County Council LFRMS[12] which gives a high level overview of where groundwater flooding may occur based on a conceptual understanding of regional geology and hydrogeology. Described further in Section 2.4.
Aquifer Designation	The aquifer designations of the underlying bedrock geology and the underlying superficial geology.
Other sources	
Flooding from reservoirs	As identified on the Environment Agency Long Term Flood Risk Map[13].
Summary	
An overview of the risk of flooding to the site now and in the future (as a result of the impacts of climate change) based on the information within the proforma.	
Site Specific Recommendations	
Recommendations for how development could be delivered on the site to meet the requirements of part 2 of the Exception Test (where required) i.e. that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Recommendations are made in line with the development management measures presented within the Level 1 SFRA[3] (Chapter 5) and typically address the following: - Applying sequential approach within development site; - Setting back development from the edge of watercourses; - Finished floor levels; - Floodplain compensation storage; - Access and egress arrangements; - Flood Warning and Evacuation procedures; - Surface water management; - Further investigation of groundwater levels.	

Table 3-2 Summary of flood risk issues and constraints for the potential development sites

Legend	Likelihood of meeting the requirements of part (B) of the Exception Test
	Development could be delivered to meet the requirements of part (B) of the Exception Test.
	Constraints identified, such as requirements for floodplain compensation storage and/or limited safe access/egress. Further discussion required with stakeholders to determine likelihood of meeting the requirements of part (B) of the Exception Test.
	Unlikely to meet the requirements of part (B) of the Exception Test.

Site ID	Site Name	Proposed Use	Vulnerability Classification	FZ1	FZ2	FZ3	ABD	Exception Test Required?	Site Specific Issues and Constraints	Summary Rating
PART 1: Sites in Flood Zone 3 where the Exception Test will be required.										
AT1/012	Ashford Community Centre, Woodthorpe Road	Community Use and Residential	Less Vulnerable and More Vulnerable	0	4	96	57	Yes	• The site is at risk of flooding from the River Ash during the design flood event (1% AEP including climate change). In order to ensure that future development does not increase the risk of flooding to the surrounding areas, the built footprint of the new development should not exceed that of the existing buildings and where possible should be reduced. Possible options could include ground floor uses that are open and would not restrict the flow of floodwater, thereby still providing storage for floodwater during the design event. • Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) is likely to be achievable along Woodthorpe Road to the south.	
RL1/011	Land at Staines and Laleham Sports Club, Worple Road, TW18 1HR	Residential and Sports Club	More Vulnerable	16	73	11	0	Yes	It is noted that Site RL1/007 immediately to the north was identified as a potential site for residential development (details of RL1/007 are in Part 2 of this Table). • Residential development should be steered towards those areas at lower risk of river flooding around the north and west of the site. • Development of the site must ensure that the risk of flooding to surrounding areas is not increased, and where possible is reduced. Therefore, any increase in building footprint within the design flood extent (1% AEP including climate change) will need to be compensated on a level for level and volume for volume basis within the site. Given that part of the site is not currently within the design flood extent this is likely to be achievable. If Sites RL1/011 and RL1/007 are considered collectively, there may be more scope to successfully manage the risk of river flooding across the wider area, ensuring that the storage capacity of the floodplain is retained. • Finished floor levels for residential accommodation must be above the design flood event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) is available for the site, along Worple Road north to Kingston Road, and then east to the A308. It is noted that the area of Flood Zone 1 adjacent to the site is a 'dry island' and parts of the egress route are located in Flood Zone 2.	
ST1/028	Leacroft Centre, Leacroft, TW18 4PB	Residential	More Vulnerable	0	16	84	0	Yes	• There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including climate change) to an area at low risk of flooding is likely to be achievable to the north of the site.	
ST1/029	Surrey CC Buildings, Burges Way, TW18	Residential	More Vulnerable	0	6	76	18	Yes	Development is not permitted in areas of Flood Zone 3b Functional Floodplain. This part of the site should be retained as floodplain and steps taken to restore the land to provide a more natural floodplain for the Sweep's Ditch. • There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development should not exceed that of the existing development, and where possible this should be reduced. • Given the modelled flood depths on the site of up ~1m, opportunities should be explored for development with lower vulnerability uses located at ground level, and residential accommodation at higher levels. Flood resilience measures should be implemented for ground floor uses which are more likely to experience flooding. Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • The main access route for this site along Burges Way is shown to be have a hazard rating of Significant (Danger for Most) and is therefore not an appropriate safe access/egress route once floodwaters have advanced. Alternative safe access/egress must be provided for occupants of the site, which may be achievable west from the site along Park Avenue, the B376 and then east onto Gresham Road.	
ST1/030	Fairways Day Centre, Knowle Green, TW18 1AJ	Residential	More Vulnerable	0	2	25	73	Yes	The majority of this site is located in the flood extent for the 5% AEP (1 in 20 year) event. Policy E2 states that within the 1 in 20 year (5% AEP) extent, existing infrastructure or solid buildings that resist water ingress are not included within the definition of Flood Zone 3b Functional Floodplain and the associated planning requirements do not apply. However, Policy E2 does not permit redevelopment that will increase the vulnerability classification of the development and the number of occupants on the site. It is therefore considered that redevelopment of this site to include residential uses is unlikely to be appropriate.	
ST1/037	Thameside House, South Street, TW18 4PR	Residential	More Vulnerable	1	75	24	0	Yes	• The entire site is at risk of flooding during the design flood event (1% AEP including climate change). In order to ensure that future development does not increase the risk of flooding to the surrounding areas, the built footprint of the new development should not exceed that of the existing building and where possible should be reduced. • Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may not be achievable from the site. The route along South Street and north on to the High Street goes underneath the railway line and is at risk of flooding. Provision of an improved route out of this area could improve the safety of future development in this area. Places of safe refuge should be designed into the development, above the design event (1% AEP including climate change).	
ST3/012	Staines Telephone Exchange, Fairfield Avenue, TW18 4AB	Residential	More Vulnerable	0	80	20	0	Yes	• The entire site is at risk of flooding during the design flood event (1% AEP including climate change). In order to ensure that future development does not increase the risk of flooding to the surrounding areas, the built footprint of the new development should not exceed that of the existing building and where possible should be reduced. • Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may be achievable from the site along Fairfield Avenue and onto London Road. Places of safe refuge should be designed into the development, above the design event (1% AEP including climate change).	

Site ID	Site Name	Proposed Use	Vulnerability Classification	FZ1	FZ2	FZ3	ABD	Exception Test Required?	Site Specific Issues and Constraints	Summary Rating
ST4/002	Car Park, Hanover House and Sea Cadet Building, Bridge Street, TW18 4TG	Residential and Hotel	More Vulnerable	1	1	67	31	Yes	Development is not permitted in areas of Flood Zone 3b Functional Floodplain. This part of the site should be retained as floodplain and steps taken to restore the land to provide a more natural edge of the River Thames. • Development of the northern part of the site may be possible. Development must not decrease the available floodplain storage and therefore the design should enable the free flow of floodwater at ground floor level. • Hotel accommodation or residential accommodation can be located at first floor level. Finished floor levels should be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may be achievable along Clarence Road. A place of safe refuge should also be provided within the development, above the design event (1% AEP including climate change).	
ST4/009	The Elmsleigh Centre and adjoining land, South Street, TW18 4QF	Residential and Retail	More Vulnerable	3	8	59	0	Yes	The proposed use for this site is retail and residential. Retail uses are defined as Less Vulnerable and are permitted on the site. Residential development is defined as More Vulnerable and is only permitted in the areas of Flood Zone 3 on this site where it can be demonstrated that the Exception Test is satisfied. • Development of greater vulnerability (i.e. residential development) should be steered towards the north of the site in areas of Flood Zone 1 in accordance with the sequential approach. • Development within the design flood extent (1% AEP including climate change) must not decrease the available floodplain storage and therefore the design should enable the free flow of floodwater at ground floor level. • Residential accommodation could be located at first floor level with retail uses below. Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Finished floor levels for retail uses do not need to be set above the design flood level, but steps should be taken to ensure that the development is appropriately flood resistant and resilient. • Any increase in built footprint in the design flood extent (1% AEP including climate change) would need to be compensated for, on a level for level and volume for volume basis within the rest of the site. Given that part of the site is not currently within the design flood extent this is likely to be achievable. • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may not be achievable from the site. The route along South Street and north on to the High Street goes underneath the railway line and is at risk of flooding. Provision of an improved route out of this area could improve the feasibility of future development in this area. Places of safe refuge should be designed into the development, above the design event (1% AEP including climate change).	
ST4/010	Riverside Surface Carpark, Thames Street, TW18 4UD	Residential	More Vulnerable	0	0	100	0	Yes	• The existing site is a car park and therefore provides flood storage in the event of flooding from the River Thames. In order to ensure that future development does not increase the risk of flooding, the ground floor level will need to remain open to enable the flow of floodwater and maintain the existing flood storage volume during the design event (1% AEP including climate change). It may be possible to provide residential units with undercroft parking. Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Development should be set back from the edge of the River Thames to enable access for riverside maintenance and to provide a buffer zone for biodiversity benefits along the river edge. • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including climate change) to an area at low risk of flooding may not be achievable for the site. Provision of an improved route out of this area could improve the feasibility of future development in this area. Places of safe refuge should be designed into the development, above the design event (1% AEP including climate change).	
ST4/011	Thames Lodge, Thames Street, TW18 4SJ	Residential	More Vulnerable	0	5	78	17	Yes	Development is not permitted in areas of currently undeveloped Flood Zone 3b Functional Floodplain. This part of the site should be retained as floodplain and steps taken to restore the land to provide a more natural edge of the River Thames. • Development of the northern part of the site away from the River Thames may be possible. Development must not decrease the available floodplain storage and therefore the design should enable the free flow of floodwater at ground floor level. • Residential accommodation can be located at first floor level. Finished floor levels should be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may be achievable along South Street. Places of safe refuge should also be designed into the development, above the design event (1% AEP including climate change).	
PART 2: Sites which are not in Flood Zone 3 in the present day, but where the risk of river flooding will increase in the future.										
SH1/015	Shepperton Youth Centre, Laleham Road, TW17 8EJ	Residential / Hostel	More Vulnerable	0	100	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zone 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given that the site and access to the site are at risk of flooding during the 1% AEP event including climate change, the following recommendations are made: • Development of the site must ensure that the risk of flooding to surrounding areas is not increased, and where possible is reduced. Given that the entire site is located within the flood extent for the design flood (1% AEP including climate change), it will not be possible to provide floodplain compensation storage within the site for any increase in building footprint. As a result, the built footprint of the new development of the site should not exceed that of the existing development which may limit the number of units that can be delivered on the site. Alternatively, some of the proposed development units could be designed to enable the free flow and storage of floodwater at ground level, with development located at higher levels. This may be achieved through the provision of undercroft open space with residential development at first floor level and above. However, it must be demonstrated that this area will be available for flood storage and this would need to be communicated to future occupants. • Finished floor levels for residential accommodation must be above the design flood event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may not be achievable for the site. This should be addressed as part of a Flood Warning and Evacuation Plan for the site. Places of safe refuge should be designed into the development, above the design event (1% AEP including climate change).	
ST1/031	Thameside Arts Centre, Wyatt Road, TW18 2AY	Residential	More Vulnerable	0	100	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zone 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given that the site and access to the site are at risk of flooding during the 1% AEP event including climate change, the following recommendations are made: • Development of the site must ensure that the risk of flooding to surrounding areas is not increased, and where possible is reduced. Given that the entire site is located within the flood extent for the design flood (1% AEP including climate change), it will not be possible to provide floodplain compensation storage within the site for any increase in building footprint. As a result, the built footprint of the new development of the site should not exceed that of the existing development. This may limit the number of units that can be delivered on the site. Alternatively, some of the proposed	

Site ID	Site Name	Proposed Use	Vulnerability Classification	FZ1	FZ2	FZ3	ABD	Exception Test Required?	Site Specific Issues and Constraints	Summary Rating
									development units could be designed to enable the free flow and storage of floodwater at ground level, with development located at higher levels. This may be achieved through the provision of undercroft open space with residential development at first floor level and above. However, it must be demonstrated that this area will be available for flood storage and this would need to be communicated to future occupants. • Finished floor levels for residential accommodation must be above the design flood event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) is achievable for the site. Details should be provided as part of a Flood Warning and Evacuation Plan for the site. Places of safe refuge should also be designed into the development, above the design event (1% AEP including climate change).	
ST3/004	34-36 (OAST House) /Car park, Kingston Road, TW18 4LN	Residential	More Vulnerable	97	3	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zones 1 and 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given that parts of the site and access to the site are at risk of flooding during the 1% AEP event including climate change, the following recommendations are made: • Apply a sequential approach and steer residential development away from those areas at risk of flooding from the River Thames during the design event (1% AEP including climate change). • Finished floor levels for residential accommodation must be above the design flood event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) is likely to be achievable north west along Kingston Road and then east along London Road.	
ST3/014	Birch House/London Road, Fairfield Avenue	Residential	More Vulnerable	35	65	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zones 1 and 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given the risk of flooding to the site and surrounding area in the future as a result of climate change the following recommendations are made: • Development should be steered away from the western part of the site which is shown to be at risk during the 1% AEP event including climate change. Any increase in built footprint in this location would need to be compensated for, on a level for level and volume for volume basis within the rest of the site. Given that part of the site is not currently within the design flood extent this is likely to be achievable. • Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) is achievable along London Road to the east.	
ST4/001	Jewsons, Moor Lane, TW18 4YN	Residential	More Vulnerable	14	86	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zones 1 and 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given that parts of the site are at risk of flooding during the 1% AEP event including climate change, the following recommendations are made: • Residential development should be steered towards those areas at lower risk of river flooding in the centre and east of the site. • Development of the site must ensure that the risk of flooding to surrounding areas is not increased, and where possible is reduced. Therefore, any increase in building footprint within the design flood extent (1% AEP including climate change) will need to be compensated on a level for level and volume for volume basis within the site. Given that part of the site is not currently within the design flood extent this is likely to be achievable. • Finished floor levels for residential accommodation must be above the design flood event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may be difficult to achieve due to the risk of flooding to the surrounding area. This should be addressed as part of a Flood Warning and Evacuation Plan for the site and places of safe refuge should also be designed into the development, above the design event (1% AEP including climate change).	
ST4/004	96-104, Church Street, TW18 4DQ	Residential	More Vulnerable	29	71	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zones 1 and 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given that parts of the site and access to the site are at risk of flooding during the 1% AEP event including climate change, the following recommendations are made: • Residential development should be steered towards those areas at lower risk of river flooding in the north of the site. • Development of the site must ensure that the risk of flooding to surrounding areas is not increased, and where possible is reduced. Therefore, any increase in building footprint within the design flood extent (1% AEP including climate change) will need to be compensated on a level for level and volume for volume basis within the site. Given that part of the site is not currently within the design flood extent this is likely to be achievable. • Finished floor levels for residential accommodation must be above the design flood event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may not be achievable from the site, given the risks of flooding to the surrounding area.	
ST4/019	Debenhams site, 35-45, High Street, TW18 4QU	Residential	More Vulnerable	87	13	0	0	No unless Highly Vulnerable proposed. However, risk of flooding from rivers increases in the future with climate change.	More Vulnerable development is permitted in Flood Zones 1 and 2, and the Exception Test is not required. A site specific FRA will be required to demonstrate that the proposed development will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Given the risk of flooding to the surrounding area the following recommendations are made: • Apply a sequential approach and steer residential development away from those areas at risk of flooding from the River Thames during the design event (1% AEP including climate change). • Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including 35% climate change allowance) may not be achievable from the site, given the risks of flooding to the surrounding area. The route along High Street goes underneath the railway line and is at risk of flooding. Provision of an improved route out of this area could improve the safety of future development in this area.	

3.3 Summary

3.3.1 Table 3-2 provides an overview of the findings for each site and identifies that development is likely to be possible on the majority of sites. However, there are a number of constraints that will require further consideration as proposals for the sites are developed.

3.3.2 Site ST1/030 (Fairways Day Centre, Knowle Green, TW18 1AJ) is brownfield land located within the 1 in 20 year (5% AEP) flood outline; in line with Policy E2, it is unlikely that development of this site to include residential, which will increase the vulnerability and the number of occupants on the site, will be considered acceptable.

3.3.3 There are also several sites with limited access/egress. Careful planning will be required to bring these sites forward in line with the necessary safety requirements.

- ST1/037 Thameside House, South Street, TW18 4PR
- ST4/009 The Elmsleigh Centre and adjoining land, South Street, TW18 4QF
- ST4/010 Riverside Surface Carpark, Thames Street, TW18 4UD
- SH1/015 Shepperton Youth Centre, Laleham Road, TW17 8EJ
- ST4/001 Jewsons, Moor Lane, TW18 4YN
- ST4/004 96-104, Church Street, TW18 4DQ
- ST4/019 Debenhams site, 35-45, High Street, TW18 4QU

3.3.4 The following sites are located entirely within the design flood extent (1% AEP including climate change), and currently used for non-residential 'Less Vulnerable' uses. For these sites, it will not be possible to provide floodplain compensation storage within the site for any increase in building footprint. As a result, the built footprint of the new development of the site should not exceed that of the existing development. This may limit the number of units that can be delivered on the site. Alternatively, some of the proposed development units could be designed to enable the free flow and storage of floodwater at ground level, with development located at higher levels. This may be achieved through the provision of undercroft open space with residential development at first floor level and above. However, it must be demonstrated that this area will be available for flood storage and this would need to be communicated to future occupants.

- SH1/015 Shepperton Youth Centre, Laleham Road, TW17 8EJ
- ST1/031 Thameside Arts Centre, Wyatt Road, TW18 2AY

Appendix A Borough-Wide Mapping

A.1 River Thames Mapping

A.2 Thames Tributaries Mapping

A.3 River Ash Mapping

A.4 River Colne Mapping

Appendix B Allocated Sites

B.1 Part 1

- AT1/012 Ashford Community Centre, Woodthorpe Road
- RL1/011 Land at Staines and Laleham Sports Club, Worple Road, TW18 1HR
- ST1/028 Leacroft Centre, Leacroft, TW18 4PB
- ST1/029 Surrey CC Buildings, Burges Way, TW18
- ST1/030 Fairways Day Centre, Knowle Green, TW18 1AJ
- ST1/037 Thameside House, South Street, TW18 4PR
- ST3/012 Staines Telephone Exchange, Fairfield Avenue, TW18 4AB
- ST4/002 Car Park, Hanover House and Sea Cadet Building, Bridge Street, TW18 4TG
- ST4/009 The Elmsleigh Centre and adjoining land, South Street, TW18 4QF
- ST4/010 Riverside Surface Carpark, Thames Street, TW18 4UD
- ST4/011 Thames Lodge, Thames Street, TW18 4SJ

B.2 Part 2

- SH1/015 Shepperton Youth Centre, Laleham Road, TW17 8EJ
- ST1/031 Thameside Arts Centre, Wyatt Road, TW18 2AY
- ST3/004 34-36 (OAST House) /Car park, Kingston Road, TW18 4LN
- ST3/014 Birch House/London Road, Fairfield Avenue
- ST4/001 Jewsons, Moor Lane, TW18 4YN
- ST4/004 96-104, Church Street, TW18 4DQ
- ST4/019 Debenhams site, 35-45, High Street, TW18 4QU