



London Borough of Richmond upon Thames

Flood Risk Sequential Test

**To support the Local Plan
Publication version**

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Flood Risk Sequential Test Report

TABLE OF CONTENTS

Flood Risk Sequential Test Report	2
1 INTRODUCTION	3
1.1 The Local Plan Review.....	3
2 Policy background and context.....	3
2.1 National policy requirements	4
2.2 Regional policy requirements	4
2.3 Local policy requirements	5
2.4 Data used for the Sequential Test analysis	6
3 THE SEQUENTIAL TEST.....	8
3.1 Identifying sites to test sequentially	8
3.2 Methodology.....	8
3.3 Scoring system.....	12
4 THE EXCEPTION TEST	12
5 SUMMARY OF INCLUDED SITES	14
6 SITE PROFILES	15
7 CONCLUSION AND SUMMARY	15
Appendix 1 – Overview map of borough including flood zones and site allocations	18
Appendix 2 – Site Profiles	19

1 INTRODUCTION

1.1 The Local Plan Review

- 1.1.1 The Publication Local Plan includes along with the planning policies, site-specific proposals for the whole borough, other than Twickenham town centre, where the Twickenham Area Action Plan applies. The final proposals in the Local Plan reflect the needs of the borough, existing national, regional and local policies, site specific constraints and opportunities and are subject to public consultation as part of the statutory planning process. The Plan looks ahead for 15 years after it is adopted in 2018, and it will introduce new development sites as well as update and replace existing proposal sites.
- 1.1.2 The main purpose for the allocation of sites in the Local Plan is to meet present and future needs for housing, employment, retail, transport, education, health, community facilities, sport and leisure, looking ahead over the next fifteen years. Future needs for these uses have been analysed, and an assessment made of how these needs could be addressed, including where these would result in site specific allocations within the Local Plan.
- 1.1.3 Public consultation on the rationale and scope for the review of the existing policies, alongside the proposed sites to be allocated, took place from 4 January 2016 until 1 February 2016. This was an additional stage of consultation by the Council (not prescribed by the Local Planning Regulations 2012) to provide the opportunity for early engagement with interested parties and Duty to Cooperate bodies. Formal (Regulation 18) consultation took place from 8 July until 19 August 2016, when there was an opportunity to comment on the priorities, policies and site allocations.

2 Policy background and context

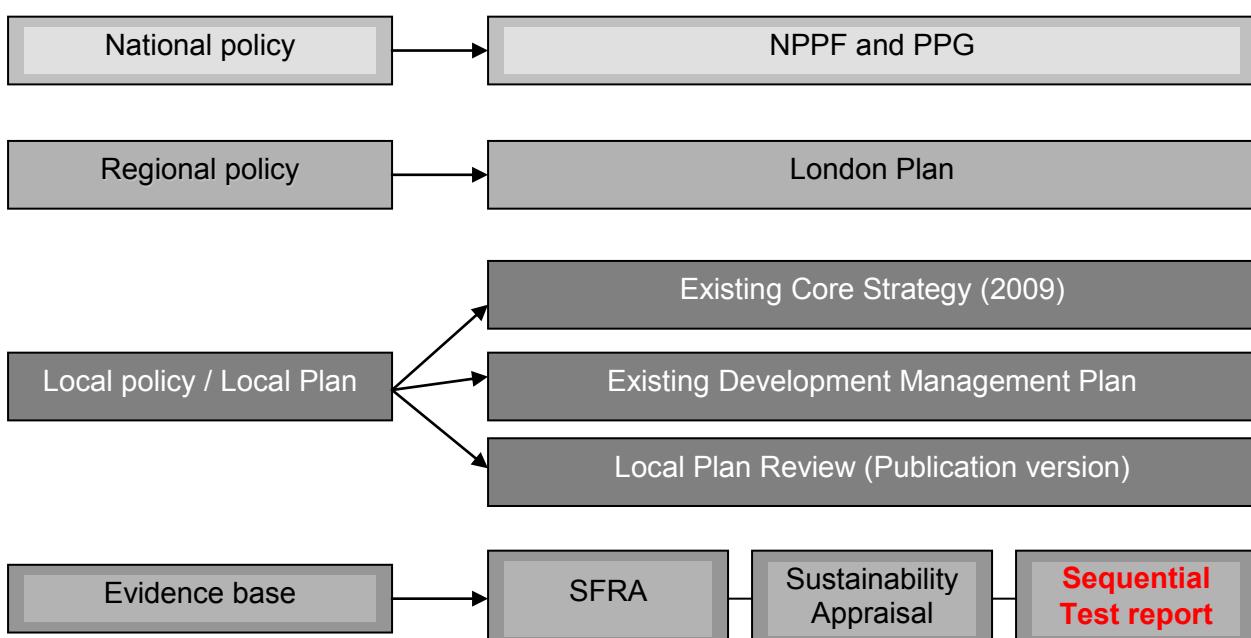


Figure 1: Context of documents referred to in this report

2.1 National policy requirements

- 2.1.1 The [National Planning Policy Framework](#) (NPPF), which was published in March 2012, superseded the Planning Policy Statement 25, which initially introduced the “Flood Risk Sequential Test” to the planning system. The NPPF must be taken into account in the preparation of local plans and policies. The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.
- 2.1.2 The NPPF also sets out that the Strategic Flood Risk Assessment (SFRA) provides the basis for applying the Sequential Test. A sequential approach should be used in areas known to be at risk from any form of flooding.
- 2.1.3 The national [Planning Practice Guidance](#) (PPG) was first published in March 2014. This provides further information and details on how to apply the test. The Flood Zones (as set out in table 1, paragraph 18 of the PPG) are the starting point for the flood risk sequential approach. These Flood Zones refer to the probability of sea and river flooding only, ignoring the presence of existing defences. The flood zones provide the basis for applying the Sequential Test. However they do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the Council’s [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses as the SFRA refines the information on the probability of flooding, taking other sources of flooding and the impacts of climate change into account.
- 2.1.4 In plan-making, local planning authorities apply a sequential approach to site selection so that development is, as far as reasonably possible, located where the risk of flooding (from all sources) is lowest, taking account of climate change and the vulnerability of future uses to flood risk. In plan-making this involves applying the '[Sequential Test](#)' to [Local Plans](#) and, if needed, the '[Exception Test](#)' to [Local Plans](#).
- 2.1.5 Where there are no reasonably available sites in Flood Zone 1, the local planning authority should consider reasonably available sites in Flood Zone 2, taking account of the flood risk vulnerability of land uses (see tables 2 and 3 of the PPG). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test (see para. 102 of the NPPF), if required.

2.2 Regional policy requirements

- 2.2.1 The [London Plan](#) (2016) is the overall strategic plan for London, and it sets out a fully integrated economic, environmental, transport and social framework for the development of the capital for the next 20 to 25 years. It forms part of the development plan for Greater London and all London boroughs’ local plans need to be in general conformity with the London Plan. Amongst many other policies, Policy 5.12 Flood Risk Management sets out that development proposals must comply with the flood risk requirements set out in national policy over the lifetime of the development and have regard to measures proposed in Thames Estuary 2100 (TE2100) and the Thames Catchment Flood Management Plan.

2.3 Local policy requirements

- 2.3.1 The existing Local Plan for the London Borough of Richmond upon Thames is currently made up of a series of documents, as shown in the table below. All existing Local Plan documents are available to view on the [Council's website](#).

Plan	Function	Status
Core Strategy	Vision and strategic policies	Adopted in April 2009
Development Management Plan	Detailed policies for the management of development	Adopted in November 2011
Twickenham Area Action Plan	Policies and proposals for Twickenham	Adopted in July 2013
Joint West London Waste Plan	Planning for waste	Adopted in July 2015
Saved Unitary Development Plan	Saved site-specific proposals	Adopted in March 2005

- 2.3.2 The Council commenced the process of reviewing the existing planning policies within the adopted Core Strategy (2009) and Development Management Plan (2011), as well as considering the allocation of key sites for development in 2015/16. This report accompanies the second consultation on the Local Plan (referred to as the ‘Publication’ version) from 4 January until February 2017, where there is an opportunity to comment on the “soundness” of the Plan’s planning policies, site allocations and designations.
- 2.3.3 The Core Strategy outlines the vision, spatial strategy and includes 20 core planning policies on topics such as climate change, housing, employment and retailing. It provides the framework for the development of other Development Plan Documents (DPDs) within the Local Plan to build upon. This will be superseded by the Local Plan Review.
- 2.3.4 The Development Management Plan (DMP), adopted in 2011, builds on the objectives and principles of the Core Strategy and includes more detailed policies for the management of development. This will be superseded by the emerging Local Plan.
- 2.3.5 In 2013, the Council adopted the Area Action Plan for Twickenham Town Centre, which sets out detailed policies and proposals for Twickenham town centre.
- 2.3.6 The six West London boroughs (Brent, Ealing, Harrow, Hounslow, Hillingdon and Richmond upon Thames) including the Old Oak and Park Royal Development Corporation, have together prepared and adopted the West London Waste Plan. It sets out a strategy for the sustainable management of waste and also identifies and allocates sites for managing the area’s waste over the period up to 2031.
- 2.3.7 The saved Unitary Development Plan (UDP) has largely been replaced by the Local Plan (i.e. the Core Strategy and Development Management Plan). The only parts of the UDP that remain saved are the Proposal sites and these will be superseded by the allocations in the emerging Local Plan.

- 2.3.8 The **Publication Local Plan** sets out a new policy on Flood Risk and Sustainable Drainage, which will supersede existing flood risk, sustainable drainage and flood defence policies of the existing plans. The new draft policy is based on existing policies, but will set out additional specific restrictions and requirements for basements and subterranean developments.
- 2.3.9 The Council's Strategic Flood Risk Assessment (SFRA) was reviewed and updated during 2015-16, and the final version published in March 2016 (this is an update of earlier reports from 2008 and 2010). The updated SFRA includes a series of maps that define areas of flooding in the borough according to various levels of risk from the River Thames, its tributaries and other sources such as surface water. However, applicants and developers need to use both the Environment Agency's flood maps as well as the SFRA's maps to identify the flood risk to a site. A key outcome of the SFRA is the establishment of the Sequential Test; it informs the planning process by categorising the area in terms of the likelihood (or probability) that flooding will occur. The borough has therefore been delineated into the following Flood Zones:
- **Zone 1** (low probability): Land assessed as having a less than 1 in 1000 annual probability of flooding in any year (i.e. 0.1% AEP).
 - **Zone 2** (medium probability): Land assessed as having between a 1 in 100 (i.e. 1% AEP) (fluvial), or 1 in 200 (0.5% AEP) (tidal), and 1 in 1000 (i.e. 0.1% AEP) annual probability of flooding in any year.
 - **Zone 3a** (high probability): Land assessed as having a 1 in 100 or greater annual probability (i.e. 1%) of fluvial flooding, or a 1 in 200 or greater annual probability (i.e. 0.5%) of tidal flooding, in any year.
 - **Zone 3b** (functional floodplain): This zone comprises land where water has to flow or be stored in times of flood" (NPPF), or land which would flood with an annual probability of a >5% chance in any one year or is designed to flood in an extreme 0.1% chance in any one year flood. For the purposes of the Council's SFRA, Zone 3b has been defined in the following manner:
 - Land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
 - Land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas); and
 - Land subject to flooding in the 5% chance in any one year flood event (i.e. relatively frequent inundation expected).

2.4 Data used for the Sequential Test analysis

- 2.4.1 **Flood Zone classification:** It should be noted that for the purposes of assessing and sequentially testing the draft proposal sites of the Local Plan, the latest available information on Flood Zones, made available by the Environment Agency and as set out in the SFRA, and has been used; the data sources are as follows:
- Flood Zone 2
 - Flood Zone 3a
 - Flood Zone 3b
 - Flood Defences

- 2.4.2 The Environment Agency's knowledge of the floodplain and flood zones is continuously being improved by a variety of studies, detailed models, data from river flow and level monitoring stations, and actual flooding information. They have an ongoing programme of improvement, and updates are made on a quarterly basis where improved information is made available.
- 2.4.3 Flood defences: these are typically raised structures that alter natural flow patterns and prevent floodwater from entering property in times of flooding. Formal raised flood defences within the borough are set out in the SFRA. With completion of the Thames Barrier, the walls at their original heights provide the following standard of protection within the London Borough of Richmond upon Thames:
- A 0.1% chance in any one year standard of protection (SoP) against a *combined* tidal and fluvial flooding event from Richmond downstream (i.e. towards the City of London) (with the exception of Eel Pie Island).
 - A progressively decreasing SoP against a *combined* tidal and fluvial flooding event from Richmond upstream (i.e. towards Teddington). The new tidal modelling carried out by the Environment Agency suggests the SoP currently decreases to somewhat less than 1% chance in any one year at Teddington, and that this will likely decrease with time to between 5% and 2% chance in any one year by the end of the century.
 - A 0.1% chance in any one year SoP against tidal flooding *only* between Richmond and Teddington.
- 2.4.4 Vulnerability classification: The vulnerability classification has been derived from the proposed land uses as set out in the Publication version of the Local Plan. Note that where a mix of uses is proposed, the higher vulnerability classification has been used for the purposes of the sequential test.
- 2.4.5 Thames tidal breach zone, flood hazard and assessment of risk to life: The risk to life (as a result of flooding) within the borough has been assessed and delineated in the SFRA, including due to breach or overtopping of the formal flood defences. Flood Hazard assessment is a defined method to combine predicted depth and velocity into a 'hazard rating' that can be used to define the level of risk to people. The borough is protected against river and tidal flooding through the Thames Tidal Defence (TTD) system. The breach modelling and breach locations carried out and defined by the Environment Agency can be found in the SFRA. Flood hazard is not a consideration as part of the Sequential Test. However, as part of the Exception Test and in particular the need to carry out site-specific Flood Risk Assessments for development sites, developers will be expected to contact and liaise with the Environment Agency for further updates on breach modelling and to ensure the best available information is used.
- 2.4.6 Historic flood incidents: Some parts of the borough have suffered from flooding incidents in the past. As part of the Exception Test and the site-specific Flood Risk Assessments for development sites, developers will be expected to take account of and manage historic flooding incidents as required.
- 2.4.7 Surface water flooding: Some parts of the borough are susceptible to surface water flooding and have been identified via the Updated Flood Map for Surface Water datasets provided by the Environment Agency, and as set out in the SFRA. As part of the Exception Test and in particular the need to carry out site-specific Flood Risk Assessments for development sites, developers will be expected to take account of and manage any potential surface water flooding issues on the site.

3 THE SEQUENTIAL TEST

3.1 Identifying sites to test sequentially

- 3.1.1 The Publication Version of the Local Plan identifies in total 28 sites. All the sites included in the Publication Local Plan have been identified to be sequentially tested. See chapter 5 of this report for a list of all the sites that are included in the Plan. To ensure deliverability of these sites, the Sequential Test has been applied to determine their suitability and compatibility for the proposed uses in terms of flood risk.
- 3.1.2 It should be noted that the Local Plan also identifies sites for protection of offices, industrial land and businesses parks. However, there is no need to undertake a Sequential Test for employment site designations as these are existing sites, some of which may fall into a flood risk area, but it is not pragmatic to steer those away.
- 3.1.3 Out of 28 included sites:
- 20 sites are within flood zone 1 and therefore do not require the Sequential Test. As such, no further assessment (i.e. a Site Profile) is required for these.
 - 4 sites are within flood zone 2. Two of these are in zone 1 and 2, one is in zone 2 and 3a and one site is within zones 1, 2, 3a and 3b. All 4 sites require the Sequential Test to be undertaken, and therefore a Site Profile has been created for these.
 - 6 sites are within zone 3a (two of these are also partly within zone 1 and 2), and for one site some of the area falls within zone 3b. There are no sites that fall entirely within zone 3b. All 6 sites have to undergo the Sequential Test and where applicable the Exception Test in order to be allocated as part of the Plan.

See Appendix 3 of this report for the Site Profiles.

3.2 Methodology

- 3.2.1 The application of the Sequential Test as set out in this report conforms to the approach in the Planning Practice Guidance (PPG), Table 2.
- 3.2.2 Figure 2 below shows the sequential approach applied in this report; for definitions of terms used in the figure, please see the PPG. Each site included in the Pre-Publication Local Plan has gone through the process as set out in this figure.

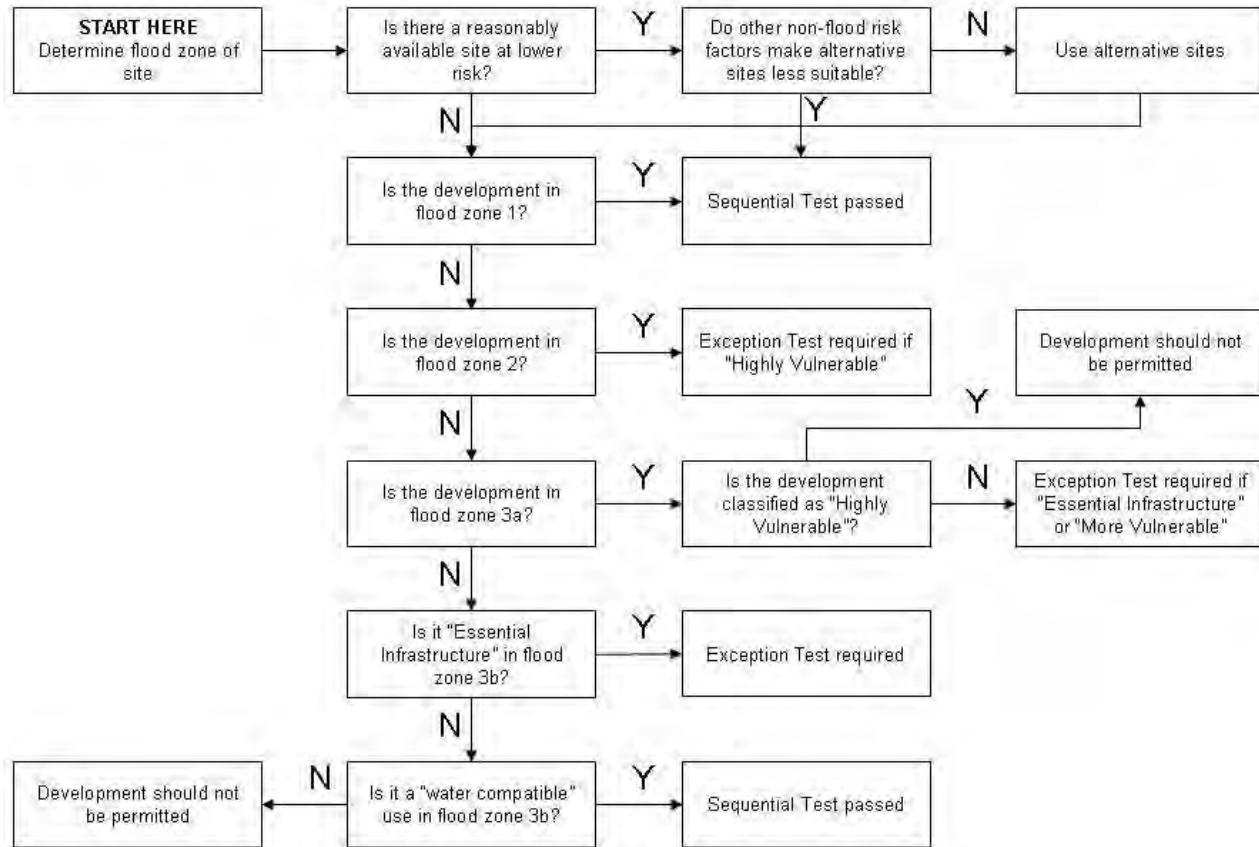


Figure 2: LBRuT Sequential Test methodology, following NPPF approach.

The flood risk vulnerability classification that is required for the Sequential Test is contained within Table 2 of the PPG (see below).

Flood risk vulnerability classification (Table 2 of PPG)

Essential infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly vulnerable

- Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.¹
- Installations requiring hazardous substances consent². (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such

¹ For any proposal involving a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site, the Sequential and Exception Tests should be applied.

² See Circular 04/00: *Planning controls for hazardous substances* (paragraph 18) at: www.communities.gov.uk/publications/planningandbuilding/circularplanningcontrols

<p>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”).³</p>
<p>More vulnerable</p> <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 waste⁴. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan.</i>⁵
<p>Less vulnerable</p> <ul style="list-style-type: none"> • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for shops, financial, professional and other services, 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 <i>not</i> 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).
<p>Water-compatible development</p> <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. • Ministry of Defence 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, <i>subject to a specific warning and evacuation plan.</i>

Notes to this table:

- a. This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People (FD2321/TR2)8* and also on the need of some uses to keep functioning during flooding.
- b. Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- c. The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

³ In considering any development proposal for such an installation, local planning authorities should have regard to planning policy on pollution in the National Planning Policy Framework.

⁴ For definition, see *Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10 at www.communities.gov.uk/publications/planningandbuilding/planningsustainable*

⁵ See footnote 1.

3.2.3 The description of the flood zones is also contained within the PPG as well as in the Council's SFRA. A summary of the description, indicating the appropriate uses (in line with the NPPF, existing policy (DM SD 6) and new draft Local Plan policy, is set out below.

Flood Zones and appropriate uses

Flood zone	Description	Annual probability of river or sea flooding	Summary of appropriate uses
Zone 1	Low probability	1 in 1000 (<0.1%) (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)	<ul style="list-style-type: none"> • All uses
Zone 2	Medium probability	1 in 100 – 1 in 1000 (1% - 0.1%) chance in any one year (river) 1 in 200 – 1 in 1000 (0.5% - 0.1%) chance in any one year (sea) (Land shown in light blue on the Flood Map)	<ul style="list-style-type: none"> • Water Compatible • Less Vulnerable • More Vulnerable • Essential Infrastructure • Highly Vulnerable only if Exception Test passed • No self-contained basements
Zone 3a	High probability	1 in 100 or greater (river) (>1%) 1 in 200 or greater (sea) (>0.5%) (Land shown in dark blue on the Flood Map)	<ul style="list-style-type: none"> • Water Compatible • Less Vulnerable • More Vulnerable only if Exception Test passed • Essential Infrastructure only if Exception Test passed • No self-contained basements
Zone 3b	The functional floodplain. This zone comprises land where water has to flow or be stored in times of flood.	1 in 20 or greater (>5%) or land which is designed to flood in an extreme (0.1%) flood; exception is Eel Pie Island	<ul style="list-style-type: none"> • Water Compatible • Essential Infrastructure only if Exception Test passed • No basements/extensions to basements

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

- 3.2.4 The application of the sequential approach aims to manage flood risk principally by avoidance of the risk. This prevents the allocation of sites that are inappropriate on flood risk grounds (see table above). When determining planning applications, the Council will ensure flood risk is not increased elsewhere, only consider development appropriate in areas at risk of flooding where informed by a site-specific flood risk assessment following the Sequential Test.
- 3.2.5 There may be instances where following the application of the Sequential Test, the development is not appropriate on flood risk grounds, however, it is consistent with wider sustainability objectives (as identified in the Sustainability Appraisal). In these cases, the Exception Test will need to be applied.

3.3 Scoring system

- 3.3.1 The Sequential Test has been applied to all sites proposed for allocation in the Local Plan. The flood risk information gathered from the various sources has been detailed in a Sequential Test Table for the allocated sites, which enables easy identification of potential development sites prone to flood risk issues and identifies requirements for further assessment (i.e. with a Site Profile), as required.
- 3.3.2 The need for further assessment is recorded in the Sequential Test Table in chapter 5 in the last column as follows:

“Site profile required”

N	Site is entirely within Flood Zone 1. Principle of proposed development has passed the Sequential Test and is therefore deemed acceptable.
Y	Site has areas in Flood Zones 2, 3a or 3b. Proposed development has not yet passed the Sequential Test and there is a need to consider whether the exception test needs to be implemented through a site profile. The site can still be deemed suitable for the proposed development should it pass further stages of the sequential and exception tests.

- 3.3.3 Chapter 5 features all of the 28 allocated sites in the pre-publication version of the Local Plan. The table sets out their flood zones and, where overall flood risk vulnerability falls into anything other than “water compatible” classification, (see Table 3 of the PPG) compatibility within the flood zone that the sites fall into is set out by indicating those that require a Site Profile. Those requiring a Site Profile must also consider the Exception Test, which is discussed below. For the Site Profiles, see Appendix 2 of this report.

4 THE EXCEPTION TEST

- 4.1.1 The Exception Test provides a method of managing flood risk while still allowing necessary sustainable development to occur.
- 4.1.2 In line with the NPPF, if, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:
- it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and
 - a site-specific flood risk assessment must demonstrate 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.
- Both elements of the test will have to be passed for development to be allocated or permitted (see paragraph 102 of the NPPF).
- 4.1.3 There are a number of sites in this borough, where the Sequential Test alone cannot deliver acceptable sites, but where some continuing development is necessary for wider sustainable development reasons, such as the Stag Brewery site in Mortlake.

- 4.1.4 Local planning authorities should ensure that flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:
- 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; and
 - development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems (see paragraph 103 of the NPPF).
- 4.1.5 To conduct the Exception Test at strategic level, a site-specific profile was produced for each site (see Appendix 2 of this report) that has areas within flood zones 2, 3a and/or 3b.
- 4.1.6 Despite the Council carrying out a high-level Exception Test for the sites proposed to be included in the Local Plan, particularly in relation to the ‘wider sustainability benefits’ test, developers will still need to demonstrate satisfactorily at planning application stage in a site-specific flood risk assessment (FRA) 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, reducing flood risk overall.

5 SUMMARY OF INCLUDED SITES

5.1.1 The following table provides a summary of all the sites included in the Pre-Publication Version of the Local Plan (in order of Reference Numbers).

Key to table:

	Flood Zone 1	Flood Zone 2	Flood Zone 3a and 3b
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Ref	Site Name	Site Address	Zone	Thames Tidal Breach Zone	Site Profile Required
SA 1	Hampton Square	Hampton Square, Hampton	Zone 1	No	N
SA2	Platts Eyot, Hampton	Platts Eyot, Lower Sunbury Road, Hampton	Zones 1, 2, 3a and 3b	No	Y
SA3	Hampton Traffic Unit	Hampton Traffic Unit, 60-68 Station Road, Hampton, Middlesex, TW12 2AX	Zone 1	No	N
SA4	Hampton Delivery Office	Hampton Delivery Office, Rosehill, Hampton, TW12 2AA	Zone 1	No	N
SA5	Telephone Exchange, Teddington	Telephone Exchange, 88 High Street, Teddington, TW11 8JD	Zone 1	No	N
SA6	Teddington Delivery Office	Teddington Delivery Office, 19 High Street, Teddington, TW11 8EG	Zone 1	No	N
SA7	Strathmore Centre	Strathmore Centre, Strathmore Road, Teddington, TW11 8UH	Zone 1	No	N
SA8	St Mary's University College	St Mary's University College, Waldegrave Road, Twickenham, TW1 4SX	Zone 1	No	N
SA9	Richmond upon Thames College	Egerton Road, Twickenham	Zone 1	No	N
SA10	The Stoop	(Harlequins RFC) Stoop Memorial Ground, Craneford Way, Twickenham	Zone 1	No	N
SA11	Twickenham Stadium	Whitton Road, Twickenham	Zones 1 and 2	No	Y
SA12	Mereway Day Centre	Mereway Road, Twickenham, TW2 6RF	Zones 1 and 2	No	Y
SA13	Telephone Exchange	Ashdale Close, Whitton, TW1 7BE	Zone 1	No	N
SA14	Kneller Hall	Royal Military School Of Music, Kneller Road, Whitton	Zone 1	No	N
SA15	Ham Close	Ham	Zone 1	No	N
SA16	Cassel Hospital	1 Ham Common, Ham	Zone 1	No	N
SA17	St Michael's Convent	Ham Common	Zone 1	No	N
SA18	Ryde House	East Twickenham	Zones 3a	Yes	Y
SA19	Richmond Station	Richmond Station, Kew Road, Richmond, TW9 2NA	Zone 1	No	N
SA20	Friars Lane Car Park	Friars Lane, Richmond	Zone 3a	Yes	Y

Ref	Site Name	Site Address	Zone	Thames Tidal Breach Zone	Site Profile Required
SA21	Sainsbury's	Lower Richmond Road, Richmond	Zone 1	No	N
SA22	Pools on the Park and surroundings	Old Deer Park, Twickenham Road, Richmond, TW9 2SF	Zone 1	No	N
SA23	Richmond Athletic Association Ground	Kew Foot Road, Richmond	Zone 1	No	N
SA24	Stag Brewery	Lower Richmond Road, Mortlake, SW14 7ET	Zones 2 and 3a	Yes	Y
SA25	Mortlake and Barnes Delivery Office	2-12 Mortlake High Street, London, SW14 8JB	Zone 3a	Yes	Y
SA26	Kew Biothane Plant	Melliss Avenue, Kew, TW9 4BA	Zone 3a	Yes	Y
SA27	Telephone Exchange and 172-176 Upper Richmond Road West	Telephone Exchange and 172-176, Upper Richmond Road West, East Sheen, SW14 8AW	Zone 1	No	N
SA28	Barnes Hospital	South Worple Way, Barnes, London, SW14 8SU	Zone 1	No	N

6 SITE PROFILES

- 6.1.1 For each individual site proposed to be included in the Local Plan, and which is proposed to be located within Flood Zone 2, 3a or 3b, a Site Profile was produced to allow further analysis.
- 6.1.2 Creating a Site Profile for any proposal sites situated partially or fully within Flood Zone 2, 3a or 3b allowed for the possibility to clarify the extent of the flood zone and consider whether the development is suitable in accordance with Tables 1 and 2 (as set out in the NPPF technical guidance). GIS analysis was used to create these Site Profiles.
- 6.1.3 In considering the appropriateness of development on a site, consideration of whether the proposed allocation could be met through intensification of development on other sites was a due consideration.

7 CONCLUSION AND SUMMARY

- 7.1.1 In total, out of 28 sites, a Site Profile was produced for 8 sites (see section 6 above for explanations of when and why a Site Profile is required).
- 7.1.2 Out of 8 sites, the majority include “more vulnerable” land uses, such as residential uses. There are also large sites with anticipated major (re-)development proposals. In all cases, the use is either an established/existing use that cannot be located elsewhere, or the site is vacant/derelict and the proposal will provide wider sustainability benefits that outweigh the need to consider locating the proposed use in an area at lower probability of flooding. A site-specific FRA would be required for any detailed proposals on all these sites.

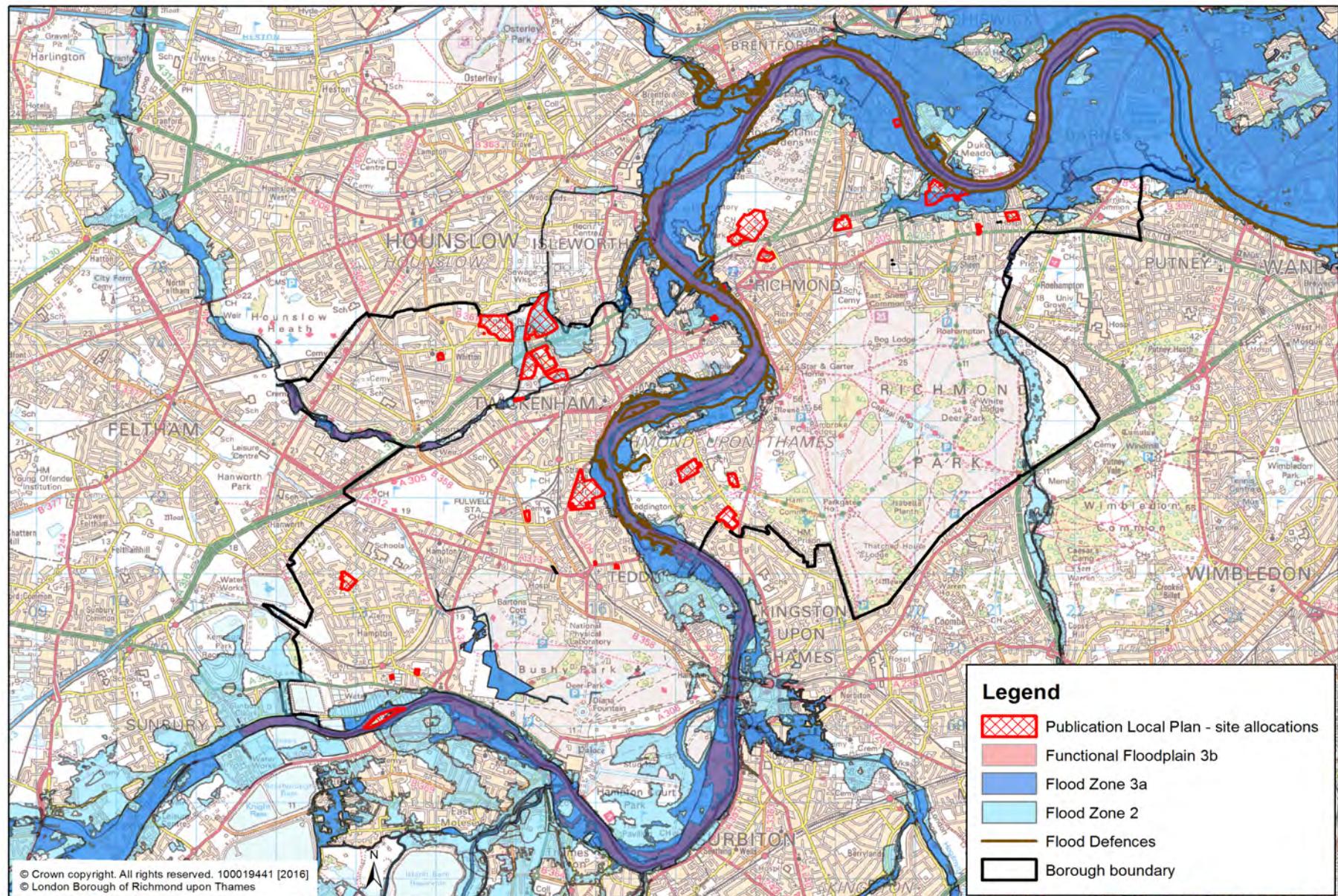
7.1.3 Please see below the reasons as to why these sites pass the Sequential Test.

- Stag Brewery site: This is a site for major redevelopment and regeneration as the brewery has closed, and as such, it is not appropriate / possible to accommodate the proposed uses on an alternative site in the borough at lower probability of flooding. The sequential approach should be applied on the site and a site-specific FRA will be required. Flood Hazard and TE2100 levels will need to be taken into account.
- Friars Lane Car Park, Richmond: This site passes the Sequential Test as the redevelopment of land that is no longer required in its existing use or vacant is considered to provide wider sustainability benefits that outweigh the need for locating the proposed residential uses in an area at lower probability of flooding, including an opportunity to meet local housing needs and improve the historic environment. The sequential approach should be applied on the site and a site-specific FRA will be required. Flood Hazard and TE2100 levels will need to be taken into account.
- Kew Biothane Plant, Kew: This is a site that is now defunct and declared surplus to requirements by Thames Water Utilities. Although it is located within Flood Zone 3a, a proposal for residential and open space is considered to provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including an opportunity to improve the environment, meeting local housing needs and providing open space. The sequential approach should be applied on the site and site-specific FRAs will be required. Flood Hazard and TE2100 levels will need to be taken into account.
- Platts Eyot, Hampton: The proposal passes the Sequential Test as the proposal relates largely to the regeneration of the existing historic and industrial uses, and residential development would be limited to the minimum necessary to achieve the regeneration of the island overall, thus providing wider sustainability benefits to the community. A site-specific FRA will be required, and safe access/egress to and from the site will be a key consideration as part of any future development proposal.
- Mortlake and Barnes Delivery Office: If this site becomes available for redevelopment and is being declared surplus to requirements by Royal Mail, then the existing use would no longer be viable and the preferred use will be a mixed use scheme with residential and employment uses. The site therefore passes the Sequential Test. The sequential approach should be applied on the site and a site-specific FRA will be required. Flood Hazard and TE2100 levels will need to be taken into account.
- Twickenham Stadium: The stadium is the home of the English RFU. As such, it would not be appropriate / possible to find an alternative site in the borough at a lower probability of flooding. Although it is located within Flood Zone 2, any surplus areas could provide space for leisure and mixed uses, which will provide wider sustainability benefits. No residential uses are proposed as part of the site allocation, but a site-specific FRA will be required.
- Ryde House: This is an existing vacant building and associated car park. Although it is located within Flood Zone 3a, redevelopment will provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including in particular an opportunity to meet local community

infrastructure needs (i.e. educational needs) and to provide retail use on the ground floor. As such, it would not be possible to find an alternative site in the borough at a lower probability of flooding. The sequential approach should be applied on the site and a site-specific FRA will be required. Flood Hazard and TE2100 levels will need to be taken into account.

- Mereway Day Centre: Although it is located within Flood Zone 2, redevelopment will provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including an opportunity to improve the environment and local character of this largely residential area, and most importantly meeting local community infrastructure needs. The sequential approach should be applied on the site and a site-specific FRA will be required.

Appendix 1 – Overview map of borough including flood zones and site allocations

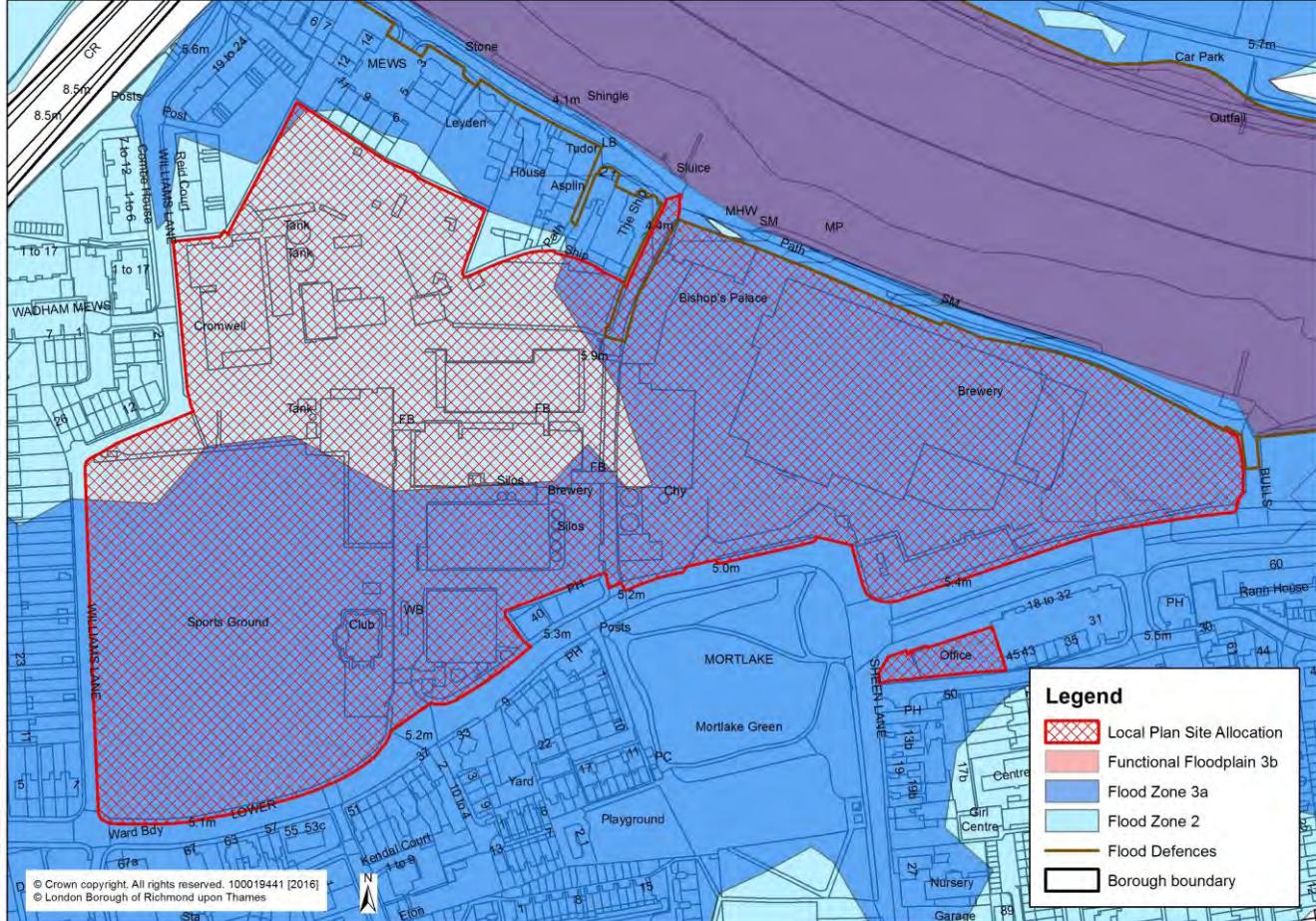


Appendix 2 – Site Profiles

Site details

Site Name, Address	The Stag Brewery, Lower Richmond Road, Mortlake, SW14 7ET
Existing Use	Former brewery
Proposed Uses	The Council will support the comprehensive redevelopment of this site. An appropriate mix of uses, particularly at ground floor levels, should deliver a new village heart and centre for Mortlake. The provision of an on-site new 6-form entry secondary school, plus sixth form, will be required. Appropriate uses, in addition to educational, include residential (including affordable housing), employment (B uses), commercial such as retail and other employment generating uses, health facilities, community and social infrastructure facilities (such as a museum), river-related uses as well as sport and leisure uses, including the retention and/or re-provision and upgrading of the playing field. The Council will expect the provision of high quality open spaces and public realm, including links through the site to integrate the development into the surrounding area as well as a new publicly accessible green space link to the riverside.
Site area	87,687 sqm

Site map with flood zones

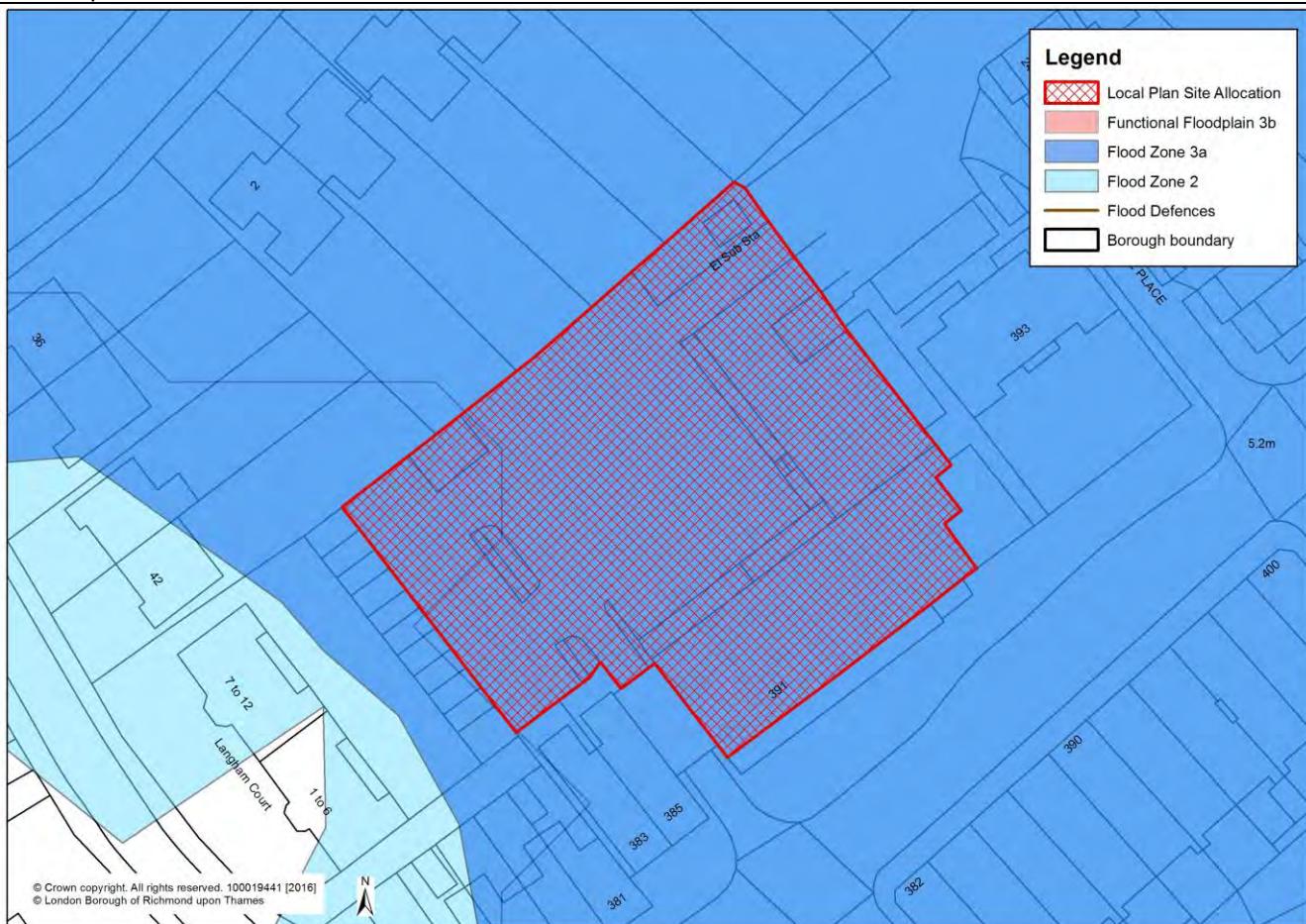


Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2					✓
Flood Zone 3a				✓	
Flood Zone 3b	✓				

Historic flood events	The Council is not aware of any historic flooding issues on this site.
Exception Test required	Yes
Key requirements for satisfying the Sequential Test	<p>This is a large site of a now closed, Budweiser brewery. Now available for redevelopment, the aim is to create a new village heart for Mortlake with a mix of uses on this site, which includes enlivening the riverside frontage. As this is a redevelopment site and an area in need of regeneration once the brewery stopped its operation, it is not appropriate / possible to accommodate the proposed uses on an alternative site in the borough.</p> <p>Water compatible uses, such as open space and some river-dependent/-related uses would be deemed acceptable anywhere on this site, without the need to apply the Exception Test.</p> <p>In line with policy DM SD 6, there shall be no basement dwellings on this site. More vulnerable uses, such as residential, should ideally be located in areas of Flood Zone 2 and therefore a sequential approach should be applied on the site. Less vulnerable uses, such as offices, business, leisure, sport uses would be deemed acceptable anywhere on this site.</p>
Consideration of alternative sites?	The site passes the Sequential Test as there are no alternative sites for the proposed use in this borough. A sequential approach should however be applied on the site, subject to other constraints (see below).
Supporting information for site-specific FRA	<p>A site-specific FRA will need to 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. In addition, it should address the following:</p> <ul style="list-style-type: none"> • Safe access/egress for all users • Sequential approach on site (e.g. locating the more vulnerable uses into area least likely to flood, i.e. in Flood Zone 2; locating more vulnerable uses on upper floors etc) • Application of SuDS hierarchy, including potential for green roof • Greenfield runoff rates • Finished floor levels to meet requirements as set out in the SFRA, taking account of TE2100 levels • Flood-resilient/-resistant construction • Flood Emergency Plan <p>Developers should also note that the site is next to the tidal flood defences and breach model information is available for this site (please refer to the Council's SFRA). Therefore, developers should request and use site-specific modelled levels from the Environment Agency. Developers should also contact the Environment Agency to determine if and how the breach data should support a site-specific FRA.</p> <p>Prior written consent from the Environment Agency will be required for any works within 16 metres of the tidal Thames; consent is also required for any works that could affect the flood defences. This consent is irrespective of planning permission.</p>

Site details

Site Name, Address	Ryde House, 391 Richmond Road , East Twickenham
Existing Use	Former office building and car park
Proposed Use	Any redevelopment proposal for this site will be required to prioritise the provision of a new 2-form entry primary school. In conjunction with the educational use, the provision of retail is considered appropriate in this location.
Site area	2639.8 sqm
Site map with flood zones	

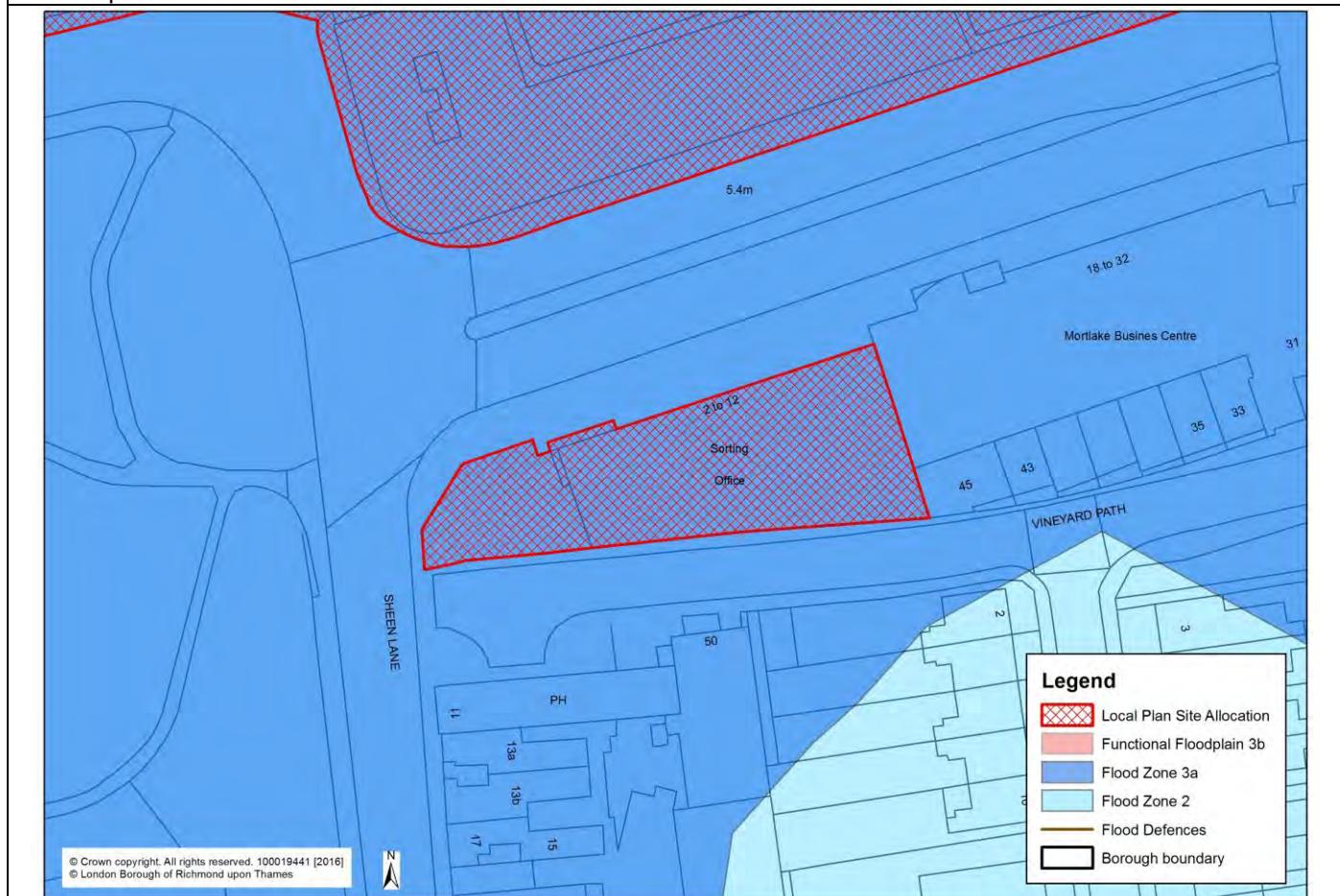


Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2					✓
Flood Zone 3a					✓
Flood Zone 3b	✓				
Historic flooding events	The Council is not aware of any historic flooding issues on this site.				
Exception Test required	Yes				
Key requirements for satisfying the Sequential Test	<p>Although the site is located within Flood Zone 3a, it will provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including in particular an opportunity to meet local educational needs and to provide retail use on the ground floor facing Richmond Road, which should add to the viability and vitality of this centre and environmental improvements in the area.</p> <p>In line with policy DM SD 6, there shall be no basement dwellings on this site. The proposed educational use is classified as “more vulnerable uses”; as the whole site is Zone 3a, a site-specific FRA will be required and a sequential approach should be applied on the site.</p> <p>Less vulnerable uses, such as retail, would be deemed acceptable anywhere on this site.</p>				

Consideration of alternative sites?	This is a redevelopment site, and it is not possible to accommodate the proposed uses on an alternative site in the borough. The site passes the Sequential Test as there are no alternative sites for the proposed uses in this borough. A sequential approach should however be applied on the site, subject to other constraints (see below).
Supporting information for site-specific FRA	A site-specific FRA will need to 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. In addition, it should address the following: <ul style="list-style-type: none">• Safe access/egress for all users• Sequential approach on site (e.g. locating more vulnerable uses on upper floors etc)• Application of SuDS hierarchy, including potential for green roof• Greenfield runoff rates• Finished floor levels to meet requirements as set out in the SFRA, taking account of TE2100 levels• Flood-resilient/-resistant construction• Flood Emergency Plan Developers should request and use site-specific modelled levels from the Environment Agency when undertaking the FRA. Developers should also note that breach model information is available for this site (please refer to the Council's SFRA). Therefore, developers should request and use site-specific modelled levels from the Environment Agency. Developers should also contact the Environment Agency to determine if and how the breach data should support a site-specific FRA.

Site details

Site Name, Address	Mortlake and Barnes Delivery Office, 2-12 Mortlake High Street, London, SW14 8JB
Existing Use	Postal Sorting Office
Proposed Use	If the site is declared surplus to requirements, appropriate land uses include employment or other commercial and retail uses. Only if employment and other commercial or employment generating uses have been explored and options discounted in line with other policies in this Plan, would the provision of housing (including affordable housing) in upper floors as part of a mixed use scheme be considered as a potential redevelopment option.
Site area	845 sqm
Site map with flood zones	<p>© Crown copyright. All rights reserved. 100019441 [2016] © London Borough of Richmond upon Thames</p>

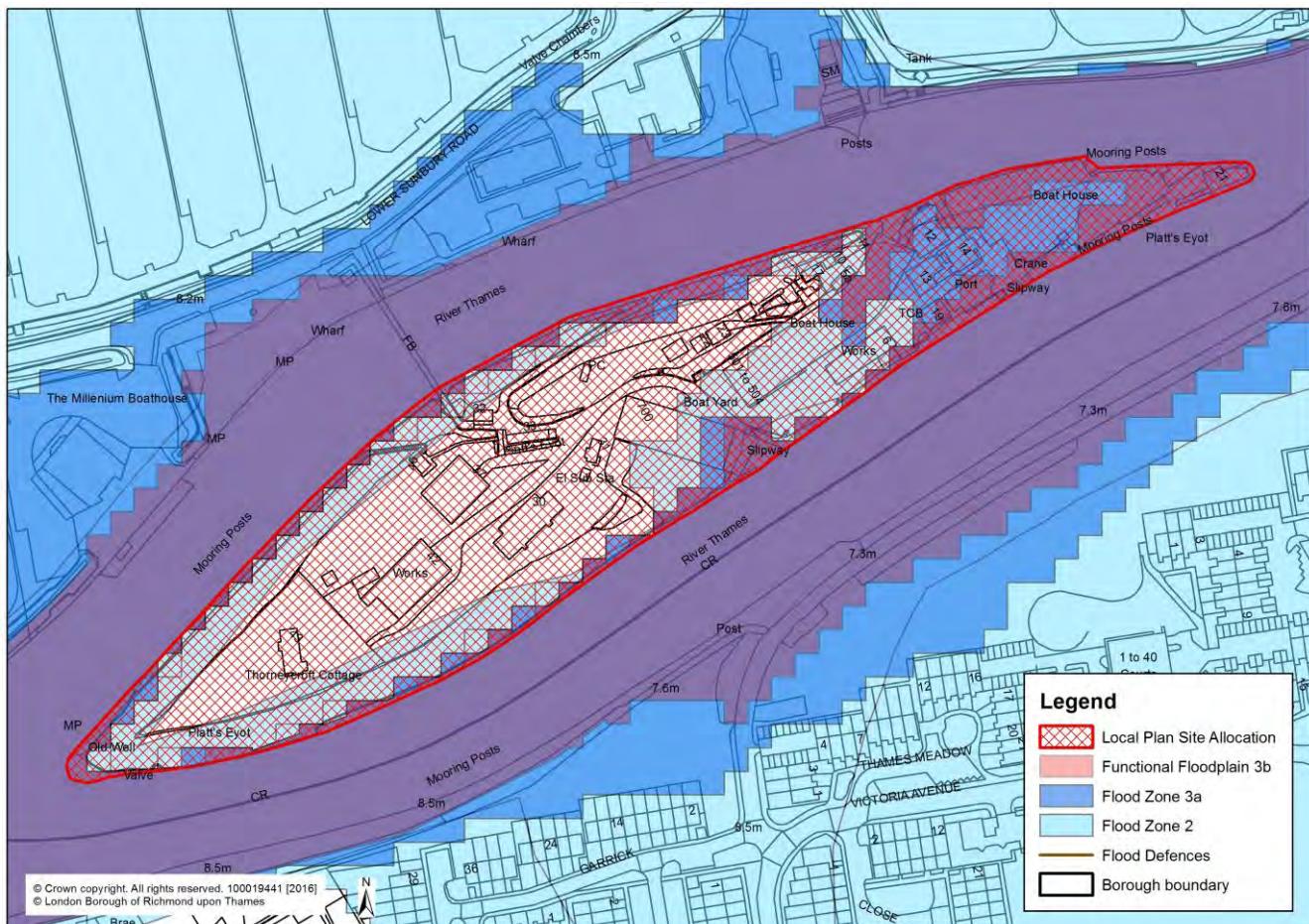


Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2					✓
Flood Zone 3a					✓
Flood Zone 3b	✓				
Historic flood events	The Council is not aware of any historic flooding issues on this site.				
Exception Test required	Yes				
Key requirements for satisfying the Sequential Test	<p>The site is located within the Mortlake Area of Mixed Use. As of 2016 Royal Mail has no plans to relocate operations from this delivery office. However, if the site is declared surplus to requirements by the Royal Mail in the longer term, the evidence suggests there is a need for employment or other commercial and retail uses in this area. Such provision should create an attractive frontage to the High Street.</p> <p>Only if employment and other commercial or employment generating uses have been explored and options discounted in line with other policies in this Plan, would the provision of housing (including affordable housing) – i.e. more vulnerable uses – in upper</p>				

	<p>floors as part of a mixed use scheme be considered as a potential redevelopment option.</p> <p>Although the site is located within Flood Zone 3a, it is considered to provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including in particular an opportunity to meet local housing needs and/or provide local employment.</p> <p>In line with policy DM SD 6, there shall be no basement dwellings on this site.</p> <p>The proposed residential use is classified as “more vulnerable uses”; as the whole site is Zone 3a, a site-specific FRA will be required and a sequential approach should be applied on the site.</p> <p>Less vulnerable uses, such as commercial or retail uses would be deemed acceptable anywhere on this site.</p>
Consideration of alternative sites?	<p>The site passes the Sequential Test as there are no alternative sites for the proposed use in this borough. A sequential approach should however be applied on the site, subject to other constraints (see below).</p>
Supporting information for site-specific FRA	<p>A site-specific FRA will need to 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. In addition, it should address the following:</p> <ul style="list-style-type: none"> • Safe access/egress for all users • Sequential approach on site (e.g. locating more vulnerable uses on upper floors etc) • Application of SuDS hierarchy, including potential for green roof • Greenfield runoff rates • Finished floor levels to meet requirements as set out in the SFRA, taking into account of TE2100 levels • Flood-resilient/-resistant construction • Flood Emergency Plan <p>Developers should request and use site-specific modelled levels from the Environment Agency when undertaking the FRA.</p>

Site details

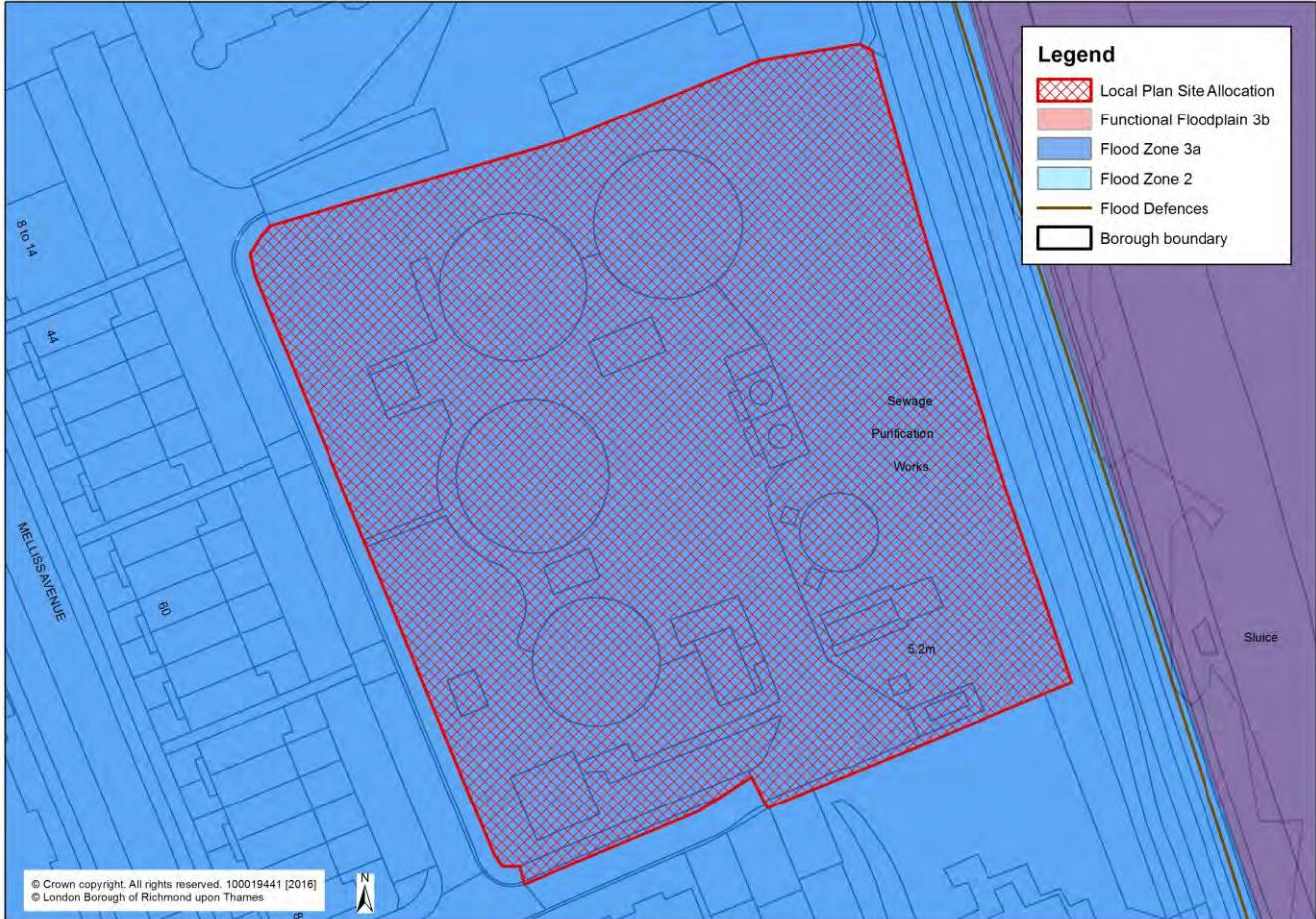
Site Name, Address	Platts Eyot, Lower Sunbury Road, Hampton
Existing Use	Deteriorating boat repairs, sound studios, workshops and engineering. Housing on other end of the island to industrial
Proposed Use	Regeneration of the island by maintaining, and where possible enhancing, existing river-dependent and river-related uses. New business and industrial uses (B1, B2 and B8) that respect and contribute to the island's special and unique character are encouraged. Residential development to allow for the restoration of the Listed Buildings, especially those on the Heritage at Risk Register, may be appropriate.
Site area	37,701 sqm
Site map with flood zones	



Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2		✓			
Flood Zone 3a		✓			
Flood Zone 3b		✓			
Exception Test required	Yes				
Key requirements for satisfying the Sequential Test	<p>This island has a unique character for its architectural and historic interest of the boatsheds and industrial history. This proposal recognises that the island would benefit from regeneration.</p> <p>It is however very constrained with protective designations including Green Belt, sites of nature conservation importance, Conservation Areas, protected trees etc.</p> <p>In addition, proposals for redevelopment in the past have not been determined due to flooding issues. Whilst the island itself is a plateau and the majority of the island is not within an area identified at risk of flooding, there are some areas to the east that are</p>				

	<p>considered to be Zone 3b and parts are also in Zone 3a. In addition, the base of the bridge, which provides access/egress, is within Zone 3b; this will have to be addressed in a site-specific FRA. The issue of safe access and egress in the event of flooding will limit the amount of residential allowed on the island.*</p> <p>The proposal only allows for a limited amount of residential development and as long as these can be located outside the flood zones, the Sequential Test will not be required. Some residential development may be needed to support the restoration of the Listed Buildings; this should be limited to the minimum necessary to achieve viability. Even if some limited enabling development did take place in Zone 2, it is considered that the Sequential Test is passed as the proposal only allows for the minimum necessary to achieve viability, i.e. the restoration of buildings on the Heritage at Risk Register and the five Listed Buildings. There should be no new development in Zone 3a, and no development will be allowed in Zone 3b, although the Sequential Test will not be required for the regeneration of the historic buildings and any existing business/industrial uses on the island.</p>
Consideration of alternative sites?	<p>This site passes the Sequential Test as the proposal relates largely to the regeneration of the existing historic and industrial uses, and residential development would be limited to the minimum necessary to achieve the regeneration of the overall island, thus it would provide wider sustainable benefits.</p>
Supporting information for site-specific FRA	<p>Any development proposal on this island that falls within a flood zone will require a site-specific FRA. This will need to 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, reducing flood risk overall.</p> <p>In particular, it will need to demonstrate safe access/egress, especially if there will be new residential development on the island.</p> <p>In addition, the FRA should address the following:</p> <ul style="list-style-type: none"> • Sequential approach on site (e.g. locating more vulnerable into area least likely to flood, i.e. in Flood Zone 1, then 2 and lastly 3a; locating more vulnerable uses on upper floors etc) • Historic flooding should be investigated • Application of SuDS hierarchy, including potential for green roof • Greenfield runoff rates • Finished floor levels to meet requirements as set out in the SFRA • Flood-resilient-resistant construction • Flood Emergency Plan (required in conjunction with safe access/egress) <p>Developers should request and use site-specific modelled levels from the Environment Agency when undertaking the FRA.</p>

Site details

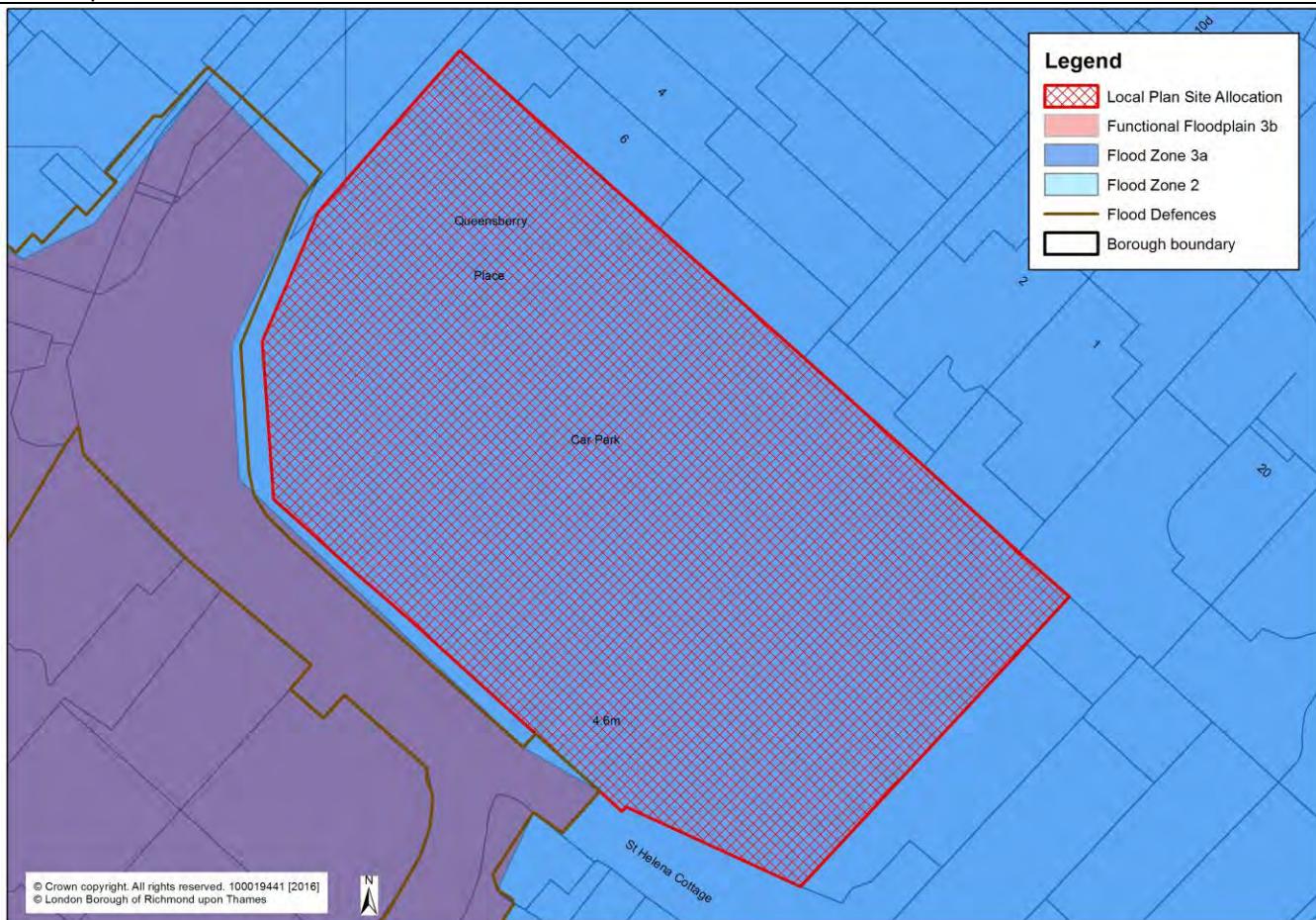
Site Name, Address	Kew Biothane Plant, Kew Biothane, Melliss Avenue, TW9 4BA
Existing Use	Since brewery operations ceased, Thames Water have declared the site surplus to requirements. There are a number of tanks, structures and small buildings over the site. There is a pedestrian gate onto the towpath and two gated vehicular access points off Melliss Avenue. When the former Kew Sewage Treatment works was redeveloped, this Biothane plant remained, described then as the 'high-tech' water treatment system processing effluent from the Stag Brewery.
Proposed Use	Redevelopment of this site to provide for residential uses, including affordable housing, and associated open space
Site area	6,934 sqm
Site map with flood zones	 <p>The map shows the Kew Biothane Plant site highlighted with a red hatched boundary. The site is located between Melliss Avenue to the west and the River Thames to the east. The River Thames is shown with a yellow line and labeled 'Flood Defences'. The map includes a legend and a north arrow. The legend identifies the following areas:</p> <ul style="list-style-type: none"> Local Plan Site Allocation (Red hatched) Functional Floodplain 3b (Pink) Flood Zone 3a (Blue) Flood Zone 2 (Light Blue) Flood Defences (Yellow line) Borough boundary (White line) <p>Key features on the map include 'Sewage Purification Works' and a 'Sluice' on the River Thames. A scale bar indicates 5.2m.</p> <p>© Crown copyright. All rights reserved. 100019441 [2016] © London Borough of Richmond upon Thames</p>

Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2					✓
Flood Zone 3a					✓
Flood Zone 3b	✓				
Exception Test required	Yes				
Key requirements for satisfying the Sequential Test	<p>The site has been declared surplus to requirements by Thames Water since the Stag Brewery operations ceased. It is considered to be previously developed land with potential for redevelopment, subject to flooding, MOL and access considerations. As such, it would not be appropriate / possible to find an alternative site in the borough at a lower probability of flooding.</p> <p>Although it is located within Flood Zone 3a, it is considered to provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including an opportunity to improve the environment, meeting local housing needs and providing open space.</p>				

	In line with policy DM SD 6, there shall be no basement dwellings on this site. The proposed uses are “residential” and thus “more vulnerable uses”; as the whole site is Zone 3a, a site-specific FRA will be required to support any development proposal.
Consideration of alternative sites?	The site passes the Sequential Test as there are no alternative sites for the proposed use in this borough. A sequential approach should however be applied on the site, subject to other constraints (see below).
Supporting information for site-specific FRA	<p>A site-specific FRA will need to 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. In addition, it should address the following:</p> <ul style="list-style-type: none"> • Safe access/egress for all users • Sequential approach on site (e.g. locating more vulnerable uses on upper floors etc.) • Application of SuDS hierarchy, including potential for green roof • Greenfield runoff rates • Finished floor levels to meet requirements as set out in the SFRA, taking account of TE2100 levels • Flood-resilient/-resistant construction • Flood Emergency Plan <p>Developers should also note that the site is next to the tidal flood defences and breach model information is available for this site. Therefore, developers should request and use site-specific modelled levels from the Environment Agency when undertaking the FRA. Developers should also note that breach model information is available for this site (please refer to the Council’s SFRA). Site-specific modelled levels from the Environment Agency should be requested. Developers should also contact the Environment Agency to determine if and how the breach data should support a site-specific FRA.</p> <p>Prior written consent from the Environment Agency will be required for any works within 16 metres of the tidal Thames; consent is also required for any works that could affect the flood defences. This consent is irrespective of planning permission.</p>

Site details

Site Name, Address	Friars Lane Car Park, Richmond
Existing Use	Car park
Proposed Use	Redevelopment of the existing under-utilised car park to provide housing, including affordable housing.
Site area	1,524 sqm
Site map with flood zones	

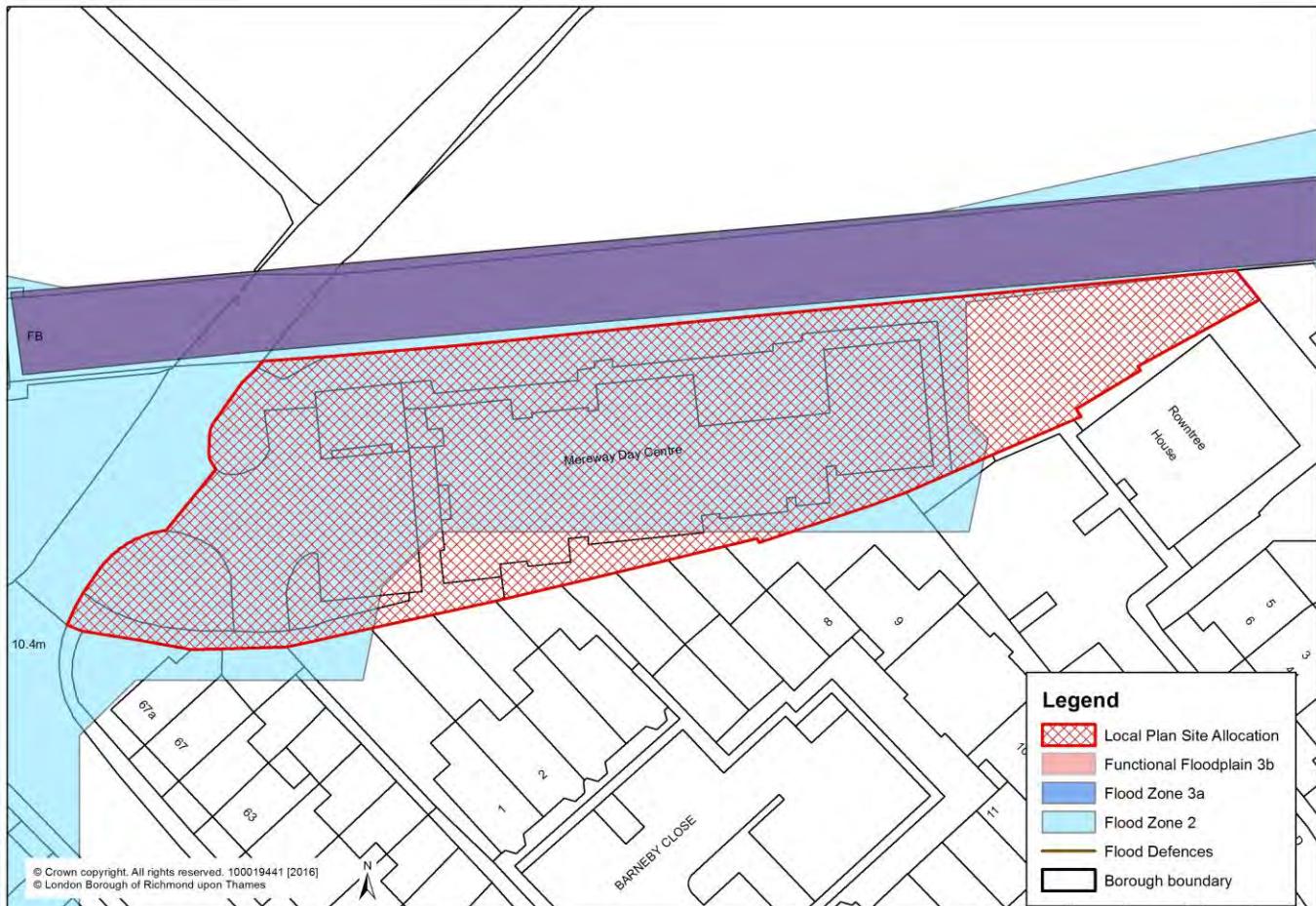


Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2					✓
Flood Zone 3a					✓
Flood Zone 3b	✓				
Exception Test required	Yes				
Key requirements for satisfying the Sequential Test	<p>This site is currently a car park, in a prominent location, within a Conservation Area and close to the historic riverside of Richmond town centre. Although it is located adjacent to the flood defences and therefore within Flood Zone 3a, the redevelopment of this site will provide wider sustainability benefits that outweigh the need for locating the proposed residential uses in an area at lower probability of flooding, including an opportunity to meet local housing needs and improving the environment. In line with policy DM SD 6, there shall be no basement dwellings on this site. The proposed uses are “residential” and thus “more vulnerable uses”; as the whole site is Zone 3a, a site-specific FRA will be required to support any development proposal.</p>				
Consideration of alternative sites?	<p>The site passes the Sequential Test as there are no alternative sites for the proposed use in this borough. A sequential approach should however be applied on the site, subject to other constraints (see below).</p>				
	<p>A site-specific FRA will need to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk</p>				

Supporting information for site-specific FRA	<p>elsewhere, and, where possible, will reduce flood risk overall. In addition, it should address the following:</p> <ul style="list-style-type: none">• Safe access/egress for all users• Sequential approach on site (e.g. locating more vulnerable uses on upper floors etc)• Application of SuDS hierarchy, including potential for green roof• Greenfield runoff rates• Finished floor levels to meet requirements as set out in the SFRA• Flood-resilient/-resistant construction• Flood Emergency Plan <p>Developers should also note that the site is next to the tidal flood defences and breach model information is available for this site. Therefore, developers should request and use site-specific modelled levels from the Environment Agency. Developers should also contact the Environment Agency to determine if and how the breach data should support a site-specific FRA.</p> <p>Prior written consent from the Environment Agency will be required for any works within 16 metres of the tidal Thames; consent is also required for any works that could affect the flood defences. This consent is irrespective of planning permission.</p>
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Site details

Site Name, Address	The Mereway Day Centre, Mereway Road, Twickenham, TW2 6RF
Existing Use	Disused Council Day centre
Proposed Use	Social and community infrastructure uses
Site area	2,268 sqm
Site map with flood zones	

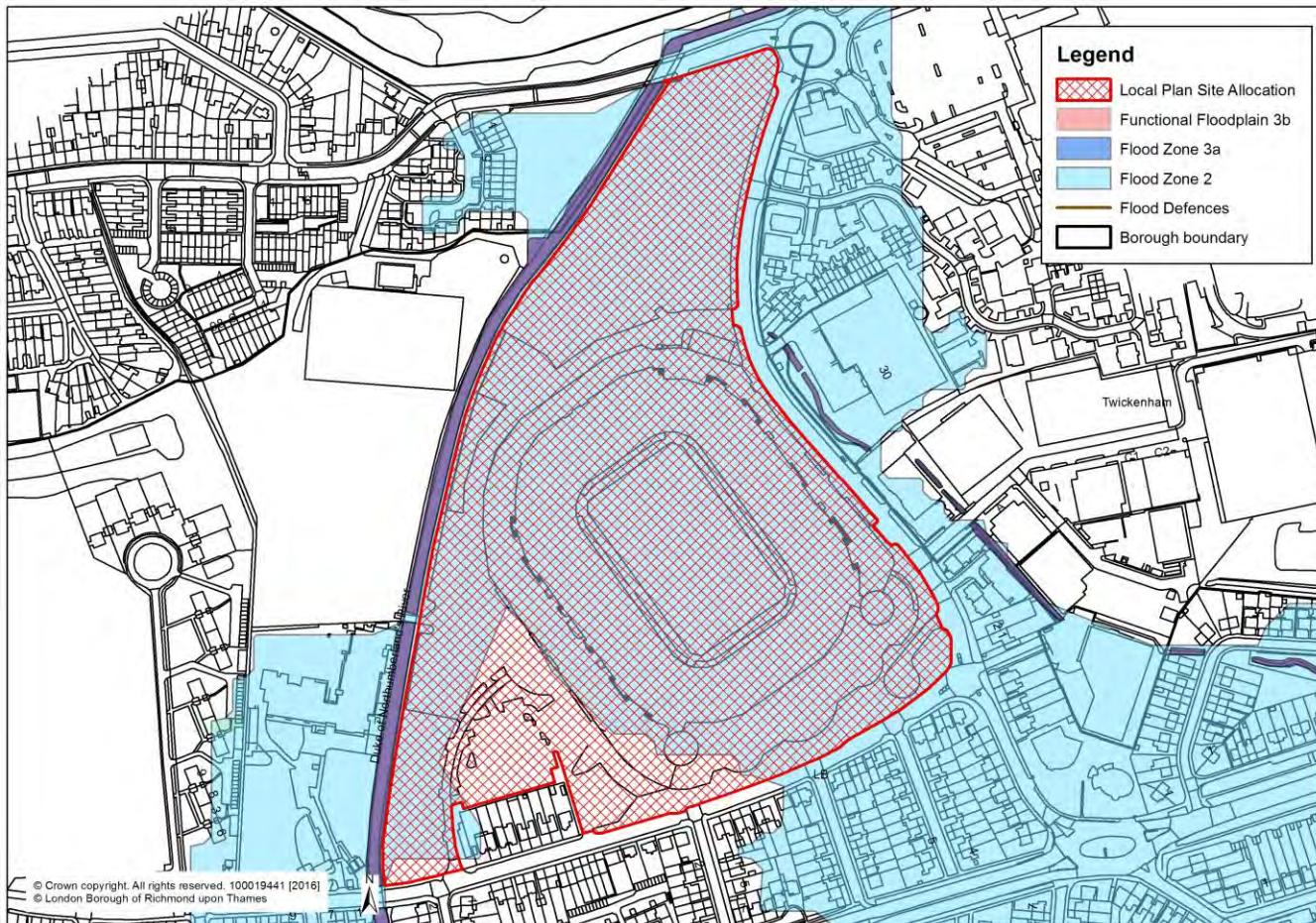


Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2				✓	
Flood Zone 3a	✓				
Flood Zone 3b	✓				
Exception Test required	No				
Key requirements for satisfying the Sequential Test	<p>There is a disused day centre on this site. There is an increasing need for the provision of childcare facilities and nurseries in the borough. This site provides an ideal location for the provision of nurseries and other child-care services. Only if other alternative social or community infrastructure uses have been explored and options discounted in line with other policies in this Plan, would a residential-led scheme with affordable housing and on-site car parking be considered as a potential redevelopment option.</p> <p>Although the site is located within Flood Zone 2, it will provide wider sustainability benefits that outweigh the need for locating the proposed uses in an area at lower probability of flooding, including an opportunity to improve the environment and local character of this largely residential area, and most importantly meeting local community or education needs.</p> <p>As such, it would not be appropriate / possible to find an alternative site in the borough at</p>				

	<p>a lower probability of flooding.</p> <p>The proposed uses are “non-residential uses for health services, nurseries and educational establishments” and thus “more vulnerable uses”; in line with the NPPF, this type of development is deemed acceptable in this type of flood zone, subject to a site-specific FRA (see below).</p>
Consideration of alternative sites?	<p>The consideration of alternative sites is not appropriate for the reasons set out above and thus this site passes the Sequential Test.</p>
Supporting information for site-specific FRA	<p>A site-specific FRA will need to 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. In addition, it should address the following:</p> <ul style="list-style-type: none"> • Safe access/egress for all users (if applicable) • Sequential approach on site (e.g. locating more vulnerable uses on upper floors etc) • Application of SuDS hierarchy, including potential for green roof • Greenfield runoff rates • Finished floor levels to meet requirements as set out in the SFRA • Flood-resilient/-resistant construction (if applicable) • Flood Emergency Plan (if applicable) <p>Developers should request and use site-specific modelled levels from the Environment Agency when undertaking the FRA.</p> <p>Prior written consent from the Environment Agency will be required for any works within 8 metres of the River Crane. This consent is irrespective of planning permission.</p>

Site details

Site Name, Address	Twickenham Stadium, Whitton Road, Twickenham
Existing Use	Rugby stadium, hotel and leisure centre, shops, conference suite, offices.
Proposed Use	Continued use and growth of the grounds for sports uses. Appropriate additional facilities including a new east and north stand, indoor leisure, hotel or business uses, as well as hospitality and conference facilities, may be supported provided that they are complementary to the main use of the site as a sports ground.
Site area	12,5982 sqm
Site map with flood zones	



Flood zones (in % of area)	0	0-25	25-50	50-75	75-100
Flood Zone 2					✓
Flood Zone 3a	✓				
Flood Zone 3b	✓				
Exception Test required	No				
Key requirements for satisfying the Sequential Test	This is the national rugby ground with an already permitted residential development to the north of the site. There is a need for associated new and complementary facilities such as a hotel, leisure centre, training facilities as well as hospitality and conference facilities. There is also a need for new office floorspace in the borough and in the event of an area of the site being declared surplus to requirements, the opportunity to provide for employment floorspace, such as offices or a business park, should be firstly explored. A mixed use scheme, with residential including affordable housing, may also be considered appropriate provided that other sporting and associated uses, including employment, have been fully investigated and that the mixed / residential use is compatible with the main use of the site, i.e. a national stadium, also taking into account the presence of the existing sewerage treatment works to the north of the site and				

	<p>residential amenity. There is a need to retain sufficient parking, particularly for coaches, servicing facilities and space for spectators and related services.</p> <p>This is an existing, nationally important, stadium and as such, it would not be appropriate / possible to find an alternative site in the borough at a lower probability of flooding. The proposed uses are a mix, ranging from “more vulnerable” to “less vulnerable” uses; in line with the NPPF, these types of uses and developments are deemed acceptable in this type of flood zone, subject to a site-specific FRA (see below).</p>
Consideration of alternative sites?	The consideration of alternative sites is not appropriate for the reasons set out above and thus this site passes the Sequential Test.
Supporting information for site-specific FRA	<p>A site-specific FRA will need to 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. In addition, it should address the following:</p> <ul style="list-style-type: none"> • Safe access/egress for all users (if applicable) • Sequential approach on site (e.g. locating more vulnerable uses on in areas least likely to flood, including in Flood Zone 1 and/or on upper floors etc) • Application of SuDS hierarchy, including potential for green roof • Greenfield runoff rates • Finished floor levels to meet requirements as set out in the SFRA • Flood-resilient/-resistant construction (if applicable) • Flood Emergency Plan (if applicable) <p>Developers should request and use site-specific modelled levels from the Environment Agency when undertaking the FRA.</p> <p>Prior written consent from the Environment Agency will be required for any works within 8 metres of the Duke of Northumberland River. This consent is irrespective of planning permission.</p>