



**Flood Risk
Sequential and
Exception Test
Technical Note**

November 2016

1.0 Introduction

- 1.1 The National Planning Policy Framework (NPPF) requires that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and to include policies to manage flood risk from all sources. It also states that Local Plans should apply a sequential, risk based approach to the location of development.
- 1.2 This technical note sets out East Herts Council's application of the flood risk Sequential Test (and where necessary the Exception Test), and how this has been used to inform the identification of proposed site allocations within the Pre-Submission version of the District Plan.

2.0 Sequential and Exception Tests

- 2.1 The Sequential Test is used to ensure that areas at little or no risk of flooding are developed in preference to areas of higher risk. The NPPF requires that, if following the application of the Sequential Test, it is not possible for development to be located in lower risk zones then the Exception Test must be applied where development is more vulnerable to flooding.
- 2.2 Planning Practice Guidance (PPG) defines each flood zone as noted in Table 1 below.

Flood Zone	Description
Flood Zone 1 – low probability	The zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)
Flood Zone 2 – medium probability	This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%), or between a 1 in 200 and 1,000 annual probability of sea flooding (0.5% - 0.1%) in any year.
Flood Zone 3a – high probability	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Flood Zone 3b – the functional floodplain	This zone comprises land where water <i>has</i> to flow or be stored in times of flood.

Table 1: Flood Zones

- 2.3 Following application of the Sequential Test, Planning Practice Guidance (PPG) also identifies the circumstances when the Exception Test should be applied. As an example, where housing (a more vulnerable use) is proposed on a site that is located within Flood Zone 3a, then the Exception Test should be applied.

2.4 Table 2 below demonstrates when the Exception Test should be applied. The definition of the vulnerability of development is identified within Table 3.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓
Key:					
✓ Development is appropriate					
✗ Development should not be permitted					

Table 2: Flood risk vulnerability and flood risk 'compatibility'

Vulnerability Classification	Description
Essential Infrastructure	<ul style="list-style-type: none"> - Essential Transport infrastructure (including mass evacuation routes) which has to cross the area at risk. - Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. - Wind turbines.
Highly Vulnerable	<ul style="list-style-type: none"> - Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. - Emergency dispersal points. - Basement dwellings. - Caravans, mobile homes and park homes intended for permanent residential use. - Installations requiring hazardous substances consent.

More Vulnerable	<ul style="list-style-type: none"> - Hospitals - Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. - Buildings used for dwelling houses, student hall of residence, drinking establishments, nightclubs and hotels. - Non-residential uses for health services, nurseries and educational establishments. - Landfill and sites used for waste management facilities for hazardous waste. - Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	<ul style="list-style-type: none"> - Police, ambulance and fire stations which are not required to be operational during flooding. - Buildings used for shops, financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the ‘More Vulnerable’ class; 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 gravel workings). - Water treatment works which do not need to remain operational during times of flood. - Sewage treatment works, if adequate measures to control pollution and manage sewage flooding events are in place.
Water Compatible Development	<ul style="list-style-type: none"> - Flood control infrastructure. - Water transmission infrastructure and pumping stations. - Sewage transmission infrastructure and pumping stations. - Sand and gravel working. - Docks, marinas and wharves. - Navigation facilities. - Ministry of Defence installations. - Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. - Water based recreation (excluding sleeping accommodation). - Lifeguard and coastguard stations. - Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. - Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 3: Flood risk vulnerability classification.

2.5 There are two elements to the Exception Test as set out below. Both elements need to be passed for a site to be allocated for development in the District Plan.

- The development must provide wider sustainability benefits that outweigh the flood risk informed by a Strategic Flood Risk Assessment; and
- It must be demonstrated that the development will be safe for its lifetime. This should be informed by a Level 2 Strategic Flood Risk Assessment. Flood warnings and evacuation issues therefore need to be considered in the design and layout of planned developments, in particular through a site specific Flood Risk Assessment (FRA).

3.0 Site selection

- 3.1 A Level 1 Strategic Flood Risk Assessment was initially undertaken by the Council, in conjunction with the Environment Agency, in 2008. The content of this document partly informed the site selection process for the East Herts District Plan in relation to identifying the location of Flood Zone 3b. However, it was recognised that much of the data that informed the SFRA was out of date, particularly with regards to river modelling, and therefore more up to date information from the Environment Agency concerning Flood Zones 2 and 3 has also been utilised.
- 3.2 An updated Level 1 SFRA, which includes Level 2 site assessments where necessary, was completed in September 2016. This technical note has therefore been based on the content of the updated SFRA.
- 3.3 The tables that follow identify how the Sequential Test, and where necessary the Exception Test, has been applied.

Sequential Test	
Site	The Goods Yard, Bishop's Stortford, BISH7
Allocation	Mixed use (residential, employment, retail)
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. The majority of the site (61.4%) is located within Flood Zone 1. 38% is located within Zone 2. This is a key brownfield site and there are no reasonable alternatives in Bishop's Stortford. The Causeway/Old River Lane Site (BISH8) is the only other available brownfield site and that is also proposed for allocation.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A

Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
It is considered that there are no reasonable alternatives to this site within lower flood zones. The Exceptions Test is not required given that only 0.6% of the site is located within Flood Zones 3a or 3b and these areas can be avoided. No Highly Vulnerable development is proposed within Flood Zone 2.	
A Flood Risk Assessment will be required at the planning application stage as development will occur in Flood Zone 2.	

Sequential Test	
Site	The Mill Site, Bishop's Stortford, BISH10
Allocation	Mixed use (residential, employment, retail)
Flood Zone	1 and 2
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. A large portion of the site (43.63%) is located within Flood Zone 1. 56.37% is located within Zone 2. While the site is not yet currently available, this is a key brownfield site and there are no reasonable alternatives in Bishop's Stortford beyond those proposed for allocation.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
It is considered that there are no reasonable alternatives to this site within lower flood zones. The Exceptions Test is not required given that the site is not located within Flood Zones 3a or 3b. No Highly Vulnerable development is proposed within Flood Zone 2.	
A Flood Risk Assessment will be required at the planning application stage as development will occur in Flood Zone 2.	

Sequential Test	
Site	The Causeway/Old River Lane, Bishop's Stortford, BISH8
Allocation	Mixed use (residential, employment, retail)
Flood Zone	1, 2, 3a
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. The majority of the site (83.24%) is located within Flood Zone 2. 3.51% is located within Zone 1, with 13.25% in Flood Zone 3a. This is a key brownfield site and there are no reasonable alternatives in Bishop's Stortford. The Goods Yard Site (BISH7) is the only other available brownfield site and that is also proposed for allocation.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	There are very few brownfield sites in the District that are available for re-development. It is also in a key location within the town centre. Re-development of the site will provide much needed new homes, but will also facilitate the delivery of new employment space which will provide wider sustainability benefits.
It must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	The vast majority of development will be located within Flood Zone 2. A small area on the north eastern section of the site is located within Zone 3a which may be developed. A Flood Risk Assessment will therefore be required. Planning applications should draw on the outcomes of the SFRA, NPPG and District Plan policies.
Summary	
It is considered that there are no reasonable alternatives to this site within lower flood zones. It is also considered that the site passes the Exceptions Test.	

Sequential Test	
Site	Reserve Secondary School Site, Bishop's Stortford, BISH4
Allocation	Residential
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
It must be demonstrated that the	N/A

development will be safe for its lifetime taking into account the vulnerability of its users.	
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed. The site also has Outline planning permission.	

Sequential Test	
Site	Bishop's Stortford High School Site, BISH6
Allocation	Residential
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed.	

Sequential Test	
Site	Bishop's Stortford North, BISH3
Allocation	Mixed use (Residential, employment, retail, education).
Flood Zone	1, 2, 3a
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
This site has received Outline planning permission.	

Sequential Test	
Site	Bishop's Stortford South, BISH5
Allocation	Mixed use (Residential, employment,

	retail, education)
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. The vast majority of the site is located within Flood Zone 1 and development can be confined to this area.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this large site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA. 91.99% of the site is Zone 1, 3.13% Zone 2, 2.85% Zone 3a, and 2.03% Zone 3b. Flood Zones 2 and 3 are associated with a small unnamed watercourse which intersects the site.</p> <p>The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. It is therefore considered that the Sequential Test has been passed.</p> <p>In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.</p>	

Sequential Test	
Site	East of Manor Links, Bishop's Stortford, BISH9
Allocation	Residential
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed.	

Sequential Test	
Site	Mead Lane, Hertford, HERT2
Allocation	Residential, Employment

Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. This is a key brownfield site and there are no reasonable alternatives in Hertford.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	There are very few brownfield sites in the District that are available for re-development, and it is the only such site in Hertford. It is also in a key location, given that it is edge of town centre and adjacent to the River Lea. Re-development of the site will provide much needed new homes, but will also facilitate the delivery of new employment space which will provide wider sustainability benefits.
It must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	The vast majority of development will be located within Flood Zone 1 or 2. A small area on the south eastern section of the site is located within Zone 3a which may be developed for employment use. A Flood Risk Assessment will therefore be required. Planning applications should draw on the outcomes of the SFRA, NPPG and District Plan policies.
Summary	
It is considered that there are no reasonable alternatives to this site within lower flood zones. It is also considered that the site passes the Exceptions Test.	

Sequential Test	
Site	North of Hertford, HERT4
Allocation	Residential
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
It must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed.	

Sequential Test	
Site	South of Hertford, HERT5

Allocation	Residential
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. The vast majority of the site is located within Flood Zone 1 and development can be confined to this area.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA. 90.64% of the site is Zone 1, 3.76% Zone 2, 3.04% Zone 3a, and 2.56% Zone 3b. Flood Zones 2 and 3 are associated with a small watercourse which forms the western boundary of the site.</p> <p>The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. The western part of the site will be used for public green space and will therefore remain undeveloped. It is therefore considered that the Sequential Test has been passed.</p> <p>In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.</p>	

Sequential Test	
Site	West of Hertford, HERT3
Allocation	Residential
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed.	

Sequential Test

Site	Land North of West Rd, Sawbridgeworth, SAWB2
Allocation	Residential, Education
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. The vast majority of the site is located within Flood Zone 1 and development can be confined to this area.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA. 97.18% of the site is Zone 1, 1.59% Zone 2, 0.79% Zone 3a, and 0.44% Zone 3b. Flood Zones 2 and 3 are associated with a small watercourse which forms the western boundary of the site.</p> <p>The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. It is therefore considered that the Sequential Test has been passed.</p> <p>In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.</p>	

Sequential Test	
Site	Land South of West Rd, Sawbridgeworth, SAWB3
Allocation	Residential
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. The vast majority of the site is located within Flood Zone 1 and development can be confined to this area.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA. 97.79% of the site is Zone 1,</p>	

1.76% Zone 2, 0.09% Zone 3a, and 0.36% Zone 3b. Flood Zones 2 and 3 are associated with a small watercourse which forms the eastern boundary of the site.

The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. It is therefore considered that the Sequential Test has been passed.

In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.

Sequential Test	
Site	Land North of Sawbridgeworth, SAWB4
Allocation	Residential
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed.	

Sequential Test	
Site	East of Stevenage, EOS1
Allocation	Residential, education
Flood Zone	1
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
The site is wholly within Flood Zone 1 and therefore the Sequential Test is passed.	

Sequential Test	
Site	Land North and East of Ware, WARE2

Allocation	Residential, education, employment, retail.
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. This very large site (126 hectares) is identified for mixed use development including 1,500 homes. The vast majority of the site is located within Flood Zone 1. Given the size of the site, and the amount of green space that will be delivered as part of the development, it will be possible to locate all development within Flood Zone 1.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
It must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA.</p> <p>The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. It is therefore considered that the Sequential Test has been passed.</p> <p>In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.</p>	

Sequential Test	
Site	The Gilston Area, GA1
Allocation	Residential, employment, education, retail.
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. This very large site (697 hectares) is identified for mixed use development including 10,000 homes. The vast majority of the site is located within Flood Zone 1. Given the size of the site, and the amount of green space that will be delivered as part of the development, it will be possible to locate all development within Flood Zone 1.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A

Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA.</p> <p>The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. It is therefore considered that the Sequential Test has been passed.</p> <p>In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.</p>	

Sequential Test	
Site	Land East of Welwyn Garden City, EWEL1
Allocation	Mixed use (residential, employment, education, retail).
Flood Zone	1, 2, 3a, 3b
Highest vulnerability of proposed use	More Vulnerable
Reasonable alternative site/s available in same or lower flood zone?	No. This very large site (75 hectares) is identified for mixed use development including 1,350 homes. 83.20% of the site is located within Flood Zone 1. Given the size of the site, and the amount of green space that will be delivered as part of the development, it will be possible to locate all development within Flood Zone 1.
Exceptions Test	
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.	N/A
Is must be demonstrated that the development will be safe for its lifetime taking into account the vulnerability of its users.	N/A
Summary	
<p>Given that this site is partly located within Flood Zones 2, 3a and 3b, a Level 2 assessment was undertaken as part of the SFRA. 83.20% of the site is Zone 1, 9.06% Zone 2, 4.65% Zone 3a, and 3.09% Zone 3b.</p> <p>The vast majority of the site is located within Flood Zone 1 and proposed development can be comfortably accommodated within this zone. It is therefore considered that the Sequential Test has been passed.</p> <p>In masterplanning the site, consideration should be given to the location of the watercourse and the associated Flood Zones.</p>	