

**Gloucester City Plan**  
**Site Allocations – Flooding Sequential Test**  
**September 2019**

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## 1. Introduction

1.1 This paper sets out how Gloucester City Council have applied the Sequential Test for housing and mixed-use allocations in Flood Zones 2 and 3a in accordance with the National Planning Policy Framework (NPPF) and national Planning Practice Guidance (PPG). The purpose of the sequential approach is to ensure that, wherever possible, sites with a low risk of flooding are allocated and developed in preference to sites which are at a higher risk.

1.2 The Sequential Test may be divided into 2 main elements or parts:

(a) Part 1: Information about the allocations including flood risk, flood defenses, the existing and proposed site uses and the related vulnerability classifications; and

(b) Part 2: The sequential test for each site.

## 2. Context

2.1 Gloucester as a city is at significant risk of flooding due to its proximity to the River Severn and its flood plain and the numerous small tributaries of the Severn that crisscross the City.

2.2 In the summer of 2007 Gloucester suffered extreme flooding. Many homes and businesses were flooded and the city's drinking water supply was cut off for a number of weeks.

2.3 Gloucester has been identified as a 'Flood Risk Area' by the Environment Agency following a preliminary flood risk assessment for river, sea and reservoir flooding, carried out to meet the requirements of the European Floods Directive (2007/60/EC) (transposed into the Flood Risk Regulations (2009)). Flood Risk Areas are where the risk of flooding is likely to be significant at a national scale for people, the economy or the environment (including cultural heritage). As such, it is particularly important that Gloucester has robust policy with respect to flooding, sustainable drainage, watercourses and wastewater. All of Gloucester's watercourses are considered to lack capacity during design rainfall events; any increase in surface water discharge from development sites therefore represents an increase in flood risk.

2.4 The sites considered for sequential testing are all either in or on the edge of Gloucester City Centre. They are all sites in need of regeneration and in most cases, work has been ongoing for many years to bring about positive and sustainable development solutions.

2.5 The sequential tests of the allocations within City Plan are informed by:

- The Level 2 Strategic Flood Risk Assessment (SFRA) (2019)

- The Level 1 SFRA (2007) and Level 2 SFRA (2011) originally published by the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (JCS) group and subsequent Addendums.

2.6 The SFRA has updated information on surface water management and Sustainable Drainage Systems (SuDS), guidance for site-specific Flood Risk Assessments (FRAs) and opportunities to reduce flood risk to existing communities within Gloucester City, due to the revisions to national and local planning policy and guidance.

2.7 The SFRA Level 2 (2019) considered 24 site allocations and for seven of these it was considered necessary to undertake a Level 2 assessment. These sites are as follows: SA02 Barnwood Manor, SA07 Lynton Fields, SA08 Kings Quarter, SA09 Former Quayside House, SA13 Land at St Oswalds, SA18 Land off Eastgate Street and SA24 Part of West Quay.

2.8 Of these sites, three have only small areas in Flood Zone (FZ) 2 and it is clear from the SFRA Level 2 (2019) that development and certainly more vulnerable development can be directed away from these areas. Four sites

however are mostly in FZ2 and one site has a relatively high percentage of land in FZ2 & FZ3. These sites need to be subject to the Sequential Test.

2.9 The following table (Table 1.) gives the details of these sites in terms of: The Flood Zone percentages, the principle source of risk, existing flood defenses, the existing use, the proposed use and the associated flood vulnerability classification for each use identified:

Table 1. Analysis of City Plan Site Options				
<b>SA08 Kings Quarter</b>	<b>FZ3B</b>	<b>FZ3A</b>	<b>FZ2</b>	<b>FZ1</b>
	0%	11%	29%	71%
<p><u>Principle flood risk</u> Flood risk to the site is associated with the River Twyver that flows culverted through the site. The flood risk is caused by an overland flow path resulting from this culvert upstream surcharging.</p> <p><u>Existing flood defenses</u> Not protected by formal defenses.</p> <p><u>Existing use</u> The site is in the heart of the city centre and links the primary shopping area with the recently completed transport hub (bus station) and railway station. The site is substantial in size, comprising retail and leisure in King’s Square, The Oxbode and St Aldate Street, as well as parts of Northgate Street, Spread Eagle Road, Market Parade, Station Road and Bruton Way.</p> <p><u>Proposed use</u> A high-density mixed-use scheme of a range of different main town centre uses including commercial floorspace, a hotel, offices, residential dwellings and city centre parking.</p> <p><u>Vulnerability classification</u></p> <ul style="list-style-type: none"> <li>• Residential (More Vulnerable)</li> <li>• Retail / Employment / Leisure (Less Vulnerable)</li> </ul>				
<b>SA09 Former Quayside House</b>	<b>FZ3B</b>	<b>FZ3A</b>	<b>FZ2</b>	<b>FZ1</b>
	Unavailable	63%	97%	3%
<p><u>Principle flood risk</u> Flood risk to the site originates from the River Severn which is located to the west of the site. Only 3% of the site is located in Flood Zone 1, at the most eastern corner of the site. Detailed modelling is available for the River Severn; however, due to the tidal influence at Gloucester, a number of scenarios are available combining river-dominant with a low tide, and tidal-dominant with a low river event. Therefore, Flood Zone 3b was unavailable for this site. Flood Zone 3a can be used as an indication of Flood Zone 3b in the absence of modelled data.</p> <p><u>Existing flood defenses</u> Demountable defense in good condition. Steps down to the River Severn from the A4301, which also incorporate flood defenses, are located approximately 20m from the site’s western boundary. The steps are approximately 5m in length.</p> <p><u>Existing use</u> Vacant brownfield site – all buildings demolished.</p> <p><u>Proposed use</u> Offices, GP surgery, Pharmacy, some residential.</p> <p><u>Vulnerability classification</u></p> <ul style="list-style-type: none"> <li>• Residential (More Vulnerable)</li> <li>• Employment / other (Less Vulnerable)</li> </ul>				
<b>SA13 Land at St Oswalds</b>	<b>FZ3B</b>	<b>FZ3A</b>	<b>FZ2</b>	<b>FZ1</b>
	Unavailable	5%	100%	0%
<p><u>Principle flood risk</u></p>				

	<p>Flood risk to the site originates from the River Severn and the River Twyver. The River Twyver has existing modelling available, but only the mapped output for the more detailed 2D domain was provided, therefore there are no results in the vicinity of the site. However, the site is elevated on higher ground, with the site's western boundary bounding Flood Zone 3, with Flood Zone 2 completely covering the entire site. *Detailed modelling to produce Flood Zone 3b was unavailable for this site. Flood Zone 3a can be used as an indication of Flood Zone 3b in the absence of modelled data.</p> <p><u>Existing flood defenses</u> Not protected by formal defenses.</p> <p><u>Existing use</u> Vacant and cleared brownfield site</p> <p><u>Proposed use</u> Residential dwellings</p> <p><u>Vulnerability classification</u></p> <ul style="list-style-type: none"> <li>Residential (More Vulnerable)</li> </ul>			
<p><b>SA24 Part of West Quay</b></p>	<b>FZ3B</b>	<b>FZ3A</b>	<b>FZ2</b>	<b>FZ1</b>
	Unavailable	1%	100%	0%
	<p><u>Principle flood risk</u> The site is located very marginally in Flood Zone 3a via a flow path from the River Severn to the Gloucester and Sharpness Canal. The entire site is located within Flood Zone 2, with the risk originating from the River Severn. *Detailed modelling is available of the River Severn; however, due to the number of tidal-fluvial combined modelled scenarios, Flood Zone 3b was unavailable for this site. Flood Zone 3a can be used as an indication of Flood Zone 3b in the absence of modelled data.</p> <p><u>Existing flood defenses</u> Not protected by formal defenses.</p> <p><u>Existing use</u> Furniture storage, Brewery, redundant buildings</p> <p><u>Proposed use</u> Appropriate city centre uses, residential</p> <p><u>Vulnerability classification</u></p> <ul style="list-style-type: none"> <li>Residential (More Vulnerable)</li> <li>Retail / Employment (Less Vulnerable)</li> </ul>			

### 3. Sequential Test

3.1 When preparing a Local Plan, the Local Planning Authority should demonstrate it has considered a range of site allocations, using SFRA's to apply the Sequential and Exception Tests where necessary. Where necessary it is for the LPA to apply the Sequential Test to sites it seeks to allocate, but for other sites it is for a developer to supply evidence to the LPA, with a Planning Application, that the development has passed the test. A Sequential Test can be undertaken as part of a Local Plan Sustainability Appraisal. Alternatively, it can be demonstrated through a free-standing document, or as part of Strategic Housing Land or Employment Land Availability Assessments. The NPPF and Planning Practice Guidance for Flood Risk and Coastal Change describe how the Sequential Test should be applied in the preparation of a Local Plan.

3.2 A pragmatic approach should be taken when applying the Sequential Test. Gloucester City Council, with advice from the Environment Agency, are responsible for considering the extent to which Sequential Test considerations have been satisfied and will need to be satisfied that the proposed development would be safe and not lead to increased flood risk elsewhere.

3.3 General comments on Gloucester's housing need

Gloucester has a shortage of sites to meet its housing need. It is constrained to the west by the River Severn and its extensive flood plain and to the east by the M5 Motorway. It is only through cooperation with Tewkesbury Borough (through the Joint Core Strategy) that it is able to meet its housing needs and this is through the Strategic Allocations (essentially urban extensions) to Gloucester. Even with this provision Gloucester has a shortfall of about 1,000 dwellings that needs to be addressed by the end of the JCS plan period (2031). Gloucester City is always looking for new sites to meet housing and other development needs. This is part of the backdrop against which the availability of reasonable alternative sites should be considered.

### 3.4 General comments on regeneration sites in Gloucester

For many years, and in particular from the time of the formation of the Gloucester Heritage Urban Regeneration Company (GHURC) in 2006, Gloucester has been trying to regenerate a number of its key central brownfield sites. Areas include: Gloucester Quays, Gloucester Docks, Greater Blackfrais, Greyfriars, Kings Quarter, Railway Corridor, Canal Corridor. Some areas such as Gloucester Quays, the Docks, Greyfriars and parts of the Railway Corridor have been regenerated and have proved to be very successful. However other areas are still in need of regeneration. These central brownfield sites cannot be left in their current condition and in this regard, there is a regeneration imperative. More detail on this is given in the specific site analysis below.

### 3.5 Analysis

#### **SA08 Kings Quarter (4.5 gross ha)**

Can the development proposed for City Plan site allocation SA08 be located in Flood Zone 1?

No, proposals that would contribute to the regeneration of Kings Quarter cannot reasonably be located on other sites because this would result in a failure to regenerate an important and highly sustainable city centre site. Gloucester also has very limited availability of other sites. Clearly efforts should be made to direct more vulnerable uses to the parts of the site that are lower risk – those that are in Flood Zone 1 and there are some uses that are acceptable in Flood Zone 2.

According to the latest SFRA 2 modelling (2019) 71% of the site is in Flood Zone 1. City Plan Policy E6: *Flooding, sustainable drainage and waste water* is comprehensive and robust and will ensure that: *‘Development shall be safe from flooding and shall not lead to an increase in flood risk elsewhere. In accordance with the National Planning Policy Framework, flood risk betterment shall be sought through the development process. Planning permission will not be granted for any development in the functional flood plain (Flood Zone 3b) except for development with ‘water compatible’ and ‘essential infrastructure’ flood risk vulnerability development classifications.’*

Kings Quarter is the City Council’s top regeneration priority. Since 2006 and the formation of the Gloucester Heritage Urban Regeneration Company (GHURC) Kings Quarter has been earmarked for regeneration. The site is in the heart of the city centre and links the primary shopping area with the recently completed transport hub (bus station) and railway station. The site is substantial in size, comprising King’s Square, The Oxboode and St Aldate Street, as well as parts of Northgate Street, Spread Eagle Road, Market Parade, Station Road and Bruton Way. King’s Quarter has the opportunity to create lost connections between the bus and train stations, with a high-density mixed-use scheme of a range of different main town centre uses including commercial floorspace, a hotel, offices, residential dwellings and city centre parking.

Kings Quarter has been considered every year for a number of years through the SALA process (including through the panel) and at that level of assessment it was always considered reasonable that as a regeneration priority it would be able to come forward through directing more vulnerable uses to lower risk areas on site. Reasonable alternatives have been looked at through the SALA (as mentioned) and the plan process in that the Council carefully considers all the sites submitted to it. The site has been tested through the SA process at various stages of plan production. The latest SA (part of an Integrated Appraisal) shows at Table 6.2 the ‘Reasons for selection and rejection of site options to proposed allocation’. The SA Report also shows that there would be major positive effects for Sustainable Transport & Traffic, City Centre & Local Centres, Inequalities and Health. Clearly the site is a very sustainable location and the development proposed closely aligns with the City Plan’s 13 Key Principles.

### **SA09 Former Quayside House (1.6 gross ha)**

#### **Can development proposed for City Plan site allocation SA09 be located in Flood Zone 1 or 2.**

No, proposals that would contribute to the regeneration of Former Quayside House cannot reasonably be located on other sites because this would result in a failure to regenerate this site important city centre site. There are very limited alternative sites. Efforts should be made to direct more vulnerable uses to the parts of the site that are lower risk – those that are in Flood Zone 2 as opposed to Flood Zone 3A. According to the latest SFRA 2 modelling (2019) 63% of the site is in Flood Zone 3A, 97% in Flood Zone 2 and 3% in Flood Zone 1.

City Plan Policy E6: Flooding, sustainable drainage and waste water is robust and will ensure that: *‘Development shall be safe from flooding and shall not lead to an increase in flood risk elsewhere. In accordance with the National Planning Policy Framework, flood risk betterment shall be sought through the development process. Planning permission will not be granted for any development in the functional flood plain (Flood Zone 3b) except for development with ‘water compatible’ and ‘essential infrastructure’ flood risk vulnerability development classifications.’*

#### Description and overview

The site is a cleared brownfield site adjacent to Shire Hall. Formerly the site was the location of Gloucestershire County Council offices ‘Quayside House’ but these buildings have been demolished and part of the site is currently in use for staff parking. The site provides the opportunity for a higher density scheme to provide additional office accommodation to meet the operational needs of the County Council, as well as a Combined GP Practice to provide for local need and approximately 50 residential dwellings.

Since 2006 and the formation of GHURC, the site, as part of Greater Blackfriars, has been earmarked for regeneration. The acceptability of the site for certain uses has been established through the Local Development Order (16/01510/LDO). At paragraph 2.2.24 the Final Draft LDO states: ‘The Sequential Test outlined in NPPF has been applied by the local council as part of the process for identifying this area for regeneration and in establishing the LDO. As part of the site is within Flood Zones 3, the Exception Test must be applied for any More Vulnerable development, such as residential, and the FRA includes measures to satisfy the second part of the test. The justification for the development with respect to social and economic reasons is set out in the LDO Statement of Reasons.’ The permitted LDO includes detailed conditions related to flooding – numbers 21-26. These must be adhered to.

The site has been considered every year for a number of years through the SALA process (including through the panel). Reasonable alternatives have been looked at through the SALA (as mentioned) and the plan process in that the Council carefully considers all the sites submitted to it. The site has been tested through the SA process at various stages of plan production. The latest SA (part of an Integrated Appraisal) shows at Table 6.2 the ‘Reasons for selection and rejection of site options to proposed allocation’. The SA Report also shows that the site is broadly sustainable when measured against a number of criteria.

### **SA13 Land at St Oswalds (6.44 gross ha)**

#### **Can development proposed for City Plan site allocation SA13 be located in Flood Zone 1?**

No, proposals that would contribute to the regeneration of site SA13 cannot reasonably be located on other sites because this would result in a failure to regenerate this site which is close to the city centre. Gloucester has very limited housing sites available and there is no other site which is as close as St Oswalds is to the city centre and which so closely aligns with the City Plan’s 13 Key Principles, that could accommodate the proposed level of housing (c.300 dwellings). According to the latest SFRA 2 modelling (2019) 3% of the site is in Flood Zone 3A, 100% in Flood Zone 2 and 0% in Flood Zone 1. City Plan Policy E6: *Flooding, sustainable drainage and waste water* is comprehensive and robust and will ensure that: *‘Development shall be safe from flooding and shall not lead to an increase in flood risk elsewhere. In accordance with the National Planning Policy Framework, flood risk betterment shall be sought through the development process. Planning permission will not be granted for any development in the functional flood plain (Flood Zone 3b) except for development with ‘water compatible’ and ‘essential infrastructure’ flood risk vulnerability development classifications.’*

This is a large brownfield site to the west of the Tesco superstore at St Oswalds. A railway line runs the length of the southern boundary. To the north is residential development and older people's housing in the form of St Oswalds Village. To west of the site lies Archdeacon Meadow which is in the floodplain of the River Severn. The site is allocated for approximately 300 dwellings.

Since 2006 and the formation of GHURC, the site has been earmarked for regeneration. Parts of St Oswalds have been successfully regenerated but this site has yet to come forward. The site has been considered every year for a number of years through the SALA process (including through the panel). Reasonable alternatives have been looked at through the SALA (as mentioned) and the plan process in that the Council carefully considers all the sites submitted to it. The site has been tested through the SA process at various stages of plan production. The latest SA (part of an Integrated Appraisal) shows at Table 6.2 the 'Reasons for selection and rejection of site options to proposed allocation'. The SA Report shows that the site is broadly sustainable when measured against a number of criteria.

#### **SA24 Part of West Quay (0.7 gross ha)**

##### **Can development proposed for City Plan site allocation SA24 be located in Flood Zone 1?**

No, proposals that would contribute to the regeneration of site SA13 cannot reasonably be located on other sites because this would result in a failure to regenerate this site which is close to the city centre and in an important and prominent location within Gloucester Docks. According to the latest SFRA 2 modelling (2019) 1% of the site is in Flood Zone 3A, 100% is in Flood Zone 2 and 0% in Flood Zone 1. City Plan Policy E6: *Flooding, sustainable drainage and waste water* is comprehensive and robust and will ensure that: *'Development shall be safe from flooding and shall not lead to an increase in flood risk elsewhere. In accordance with the National Planning Policy Framework, flood risk betterment shall be sought through the development process. Planning permission will not be granted for any development in the functional flood plain (Flood Zone 3b) except for development with 'water compatible' and 'essential infrastructure' flood risk vulnerability development classifications.'*

This is an attractive dockside site adjacent to Gloucester's historic dry docks. The site is currently utilised by a range of different uses including Gloucester Brewery and the Furniture Recycling Project. The site offers the opportunity for a redevelopment to better reflect the character of the wider area, including the Listed Alexandra Warehouse and setting, and its location with the Docks Conservation Area.

The site has been earmarked for regeneration for many years and much of the Docks has been very successfully regenerated over recent decades through the GHURC. The site has been considered through the SALA process (including through the panel). Reasonable alternatives have been looked at through the SALA / plan process in that the Council carefully considers all the sites submitted to it. The site has been tested through the SA process at various stages of plan production. The latest SA (part of an Integrated Appraisal) shows at Table 6.2 the 'Reasons for selection and rejection of site options to proposed allocation'. The SA Report shows that the site is broadly sustainable when measured against a number of criteria.

### 3.5 Summary of Sequential Test

There are no reasonable alternative sites that are consistent with Gloucester's regeneration goals, broad sustainability objectives and specifically the Key Principles outlines in the City Plan. None of the proposed allocations will accommodate highly vulnerable uses. (See Appendix 1 for the Sequential Test & Exception Test Sequence Diagram).

#### **SA08 King's Quarter**

The site passes the Sequential Test for the reasons given in the above schedule. This does not mean that a Sequential Test will not be required at the planning application stage. As per the SFRA 2 (2019) the Exception Test will need to be applied if More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2. Additionally, Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b. More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b. Essential Infrastructure in Flood Zone 3b will require the Exception Test. As the site is a mixed-use site the highest

vulnerability classification should be taken, so if residential and commercial, the residential 'More Vulnerable' should be used.

### **SA09 Former Quayside House**

This regeneration site as part of land within an approved LDO passes the Sequential Test for the reasons given in the above schedule. A Sequential Test may also be required at the planning application stage and the conditions attached to the LDO should be met. The SFRA 2 (2019) notes that the Exception Test will need to be applied for this site if More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2. Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b. More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b. Essential Infrastructure in Flood Zone 3b will require the Exception Test. Residential development is classified as 'More Vulnerable'.

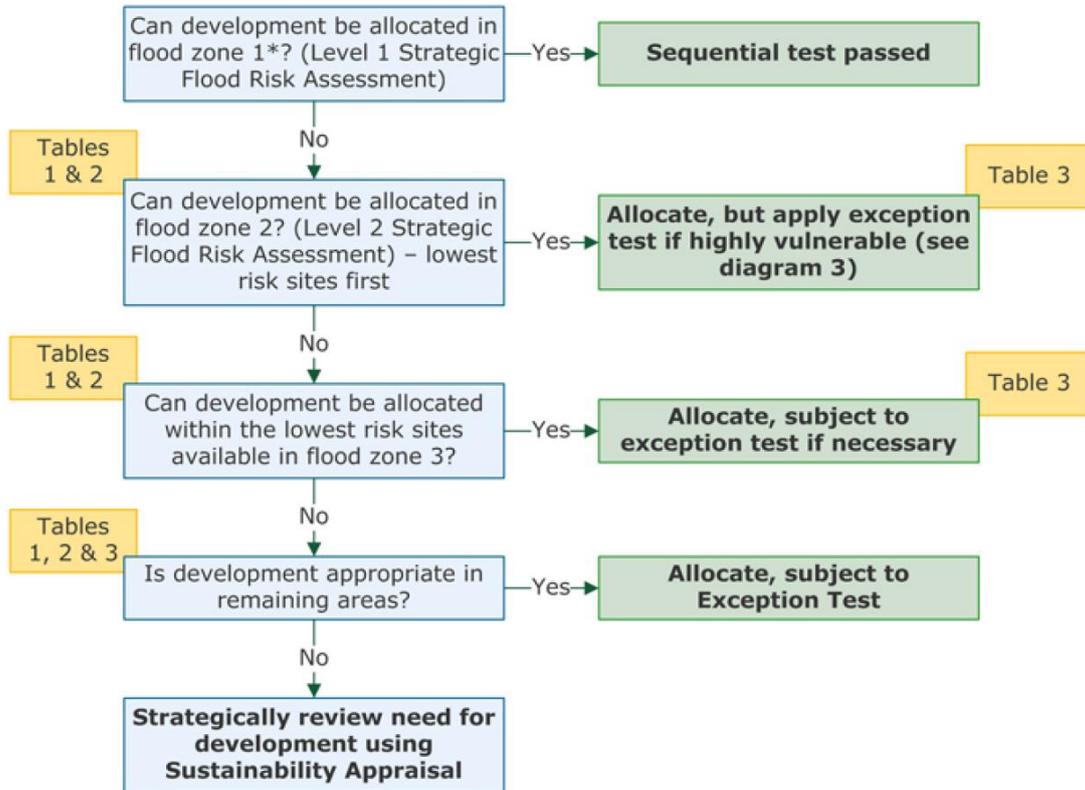
### **SA13 Land at St Oswalds**

There is no alternative land for housing of an equivalent size and located so conveniently and sustainably close to the City Centre and to central transport hubs. For this reason and for others detailed in the schedule above the site passes the Sequential Test. A Sequential Test will also be required at the planning application stage. The SFRA 2 (2019) notes that the Exception Test will need to be applied if More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2. Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b. More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b. Essential Infrastructure in Flood Zone 3b will require the Exception Test. Residential development is classified as 'More Vulnerable'.

### **SA24 Part of West Quay**

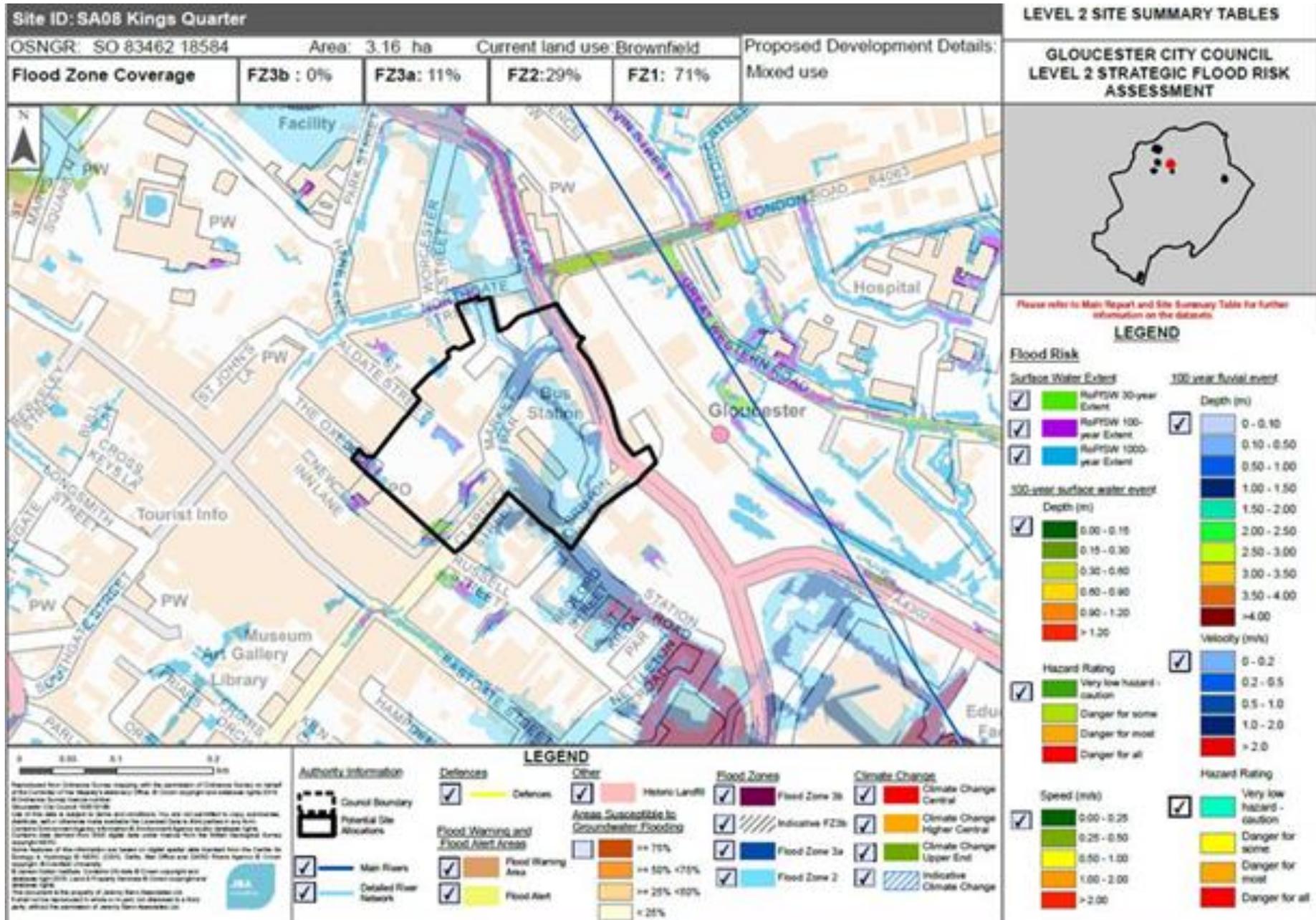
The site passes the sequential test for the reasons given in the above schedule. This does not mean that a Sequential Test will not be required at the planning application stage. As per the SFRA 2 (2019) the Exception Test will need to be applied if More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2. Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b. More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b. Essential Infrastructure in Flood Zone 3b will require the Exception Test. Residential development is classified as 'Less Vulnerable'.

### Appendix 1: Sequential Test & Exception Test Sequence Diagram

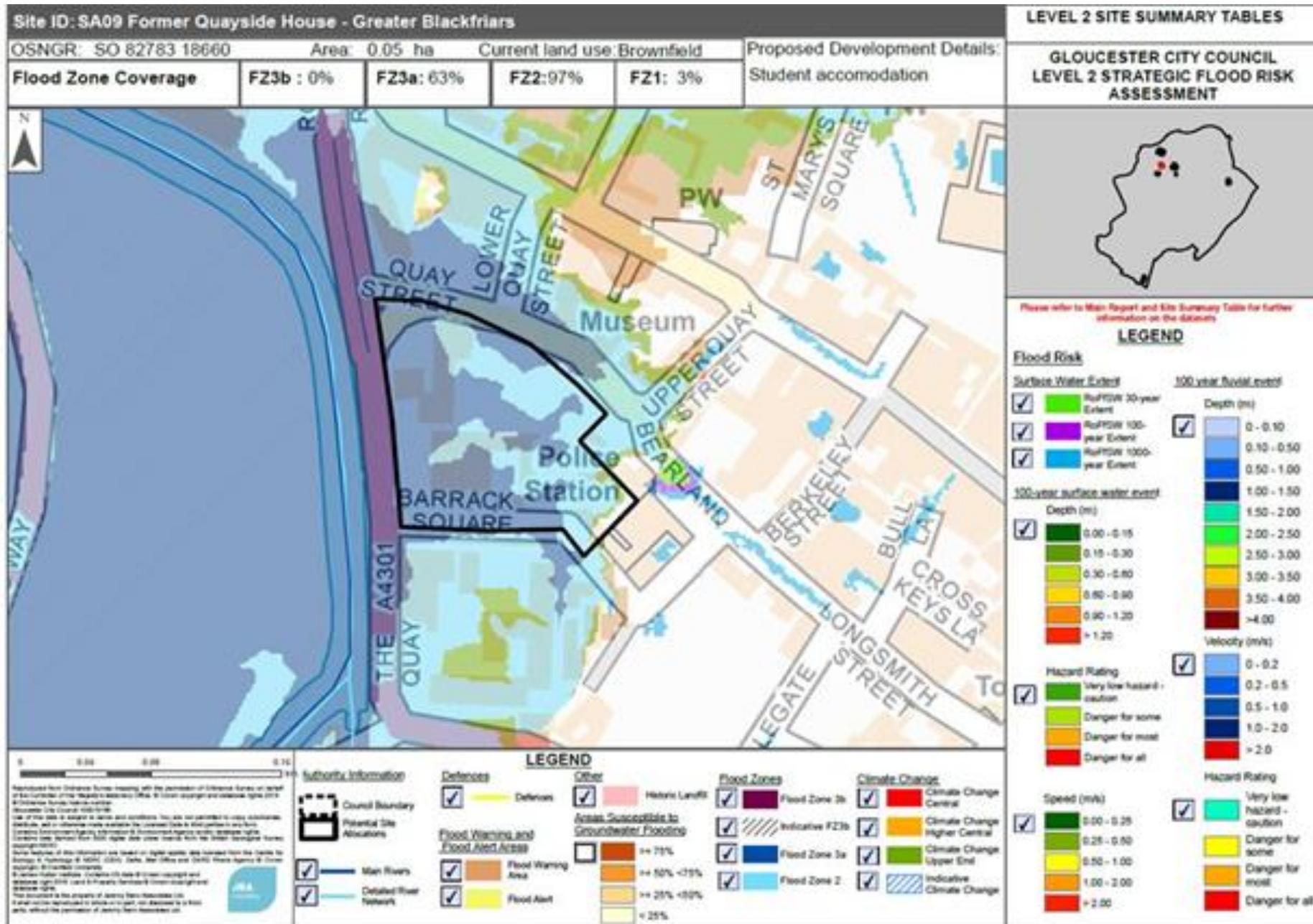


## Appendix 2: Housing allocations within Flood Zones 2 and 3a

SA08 Kings Quarter

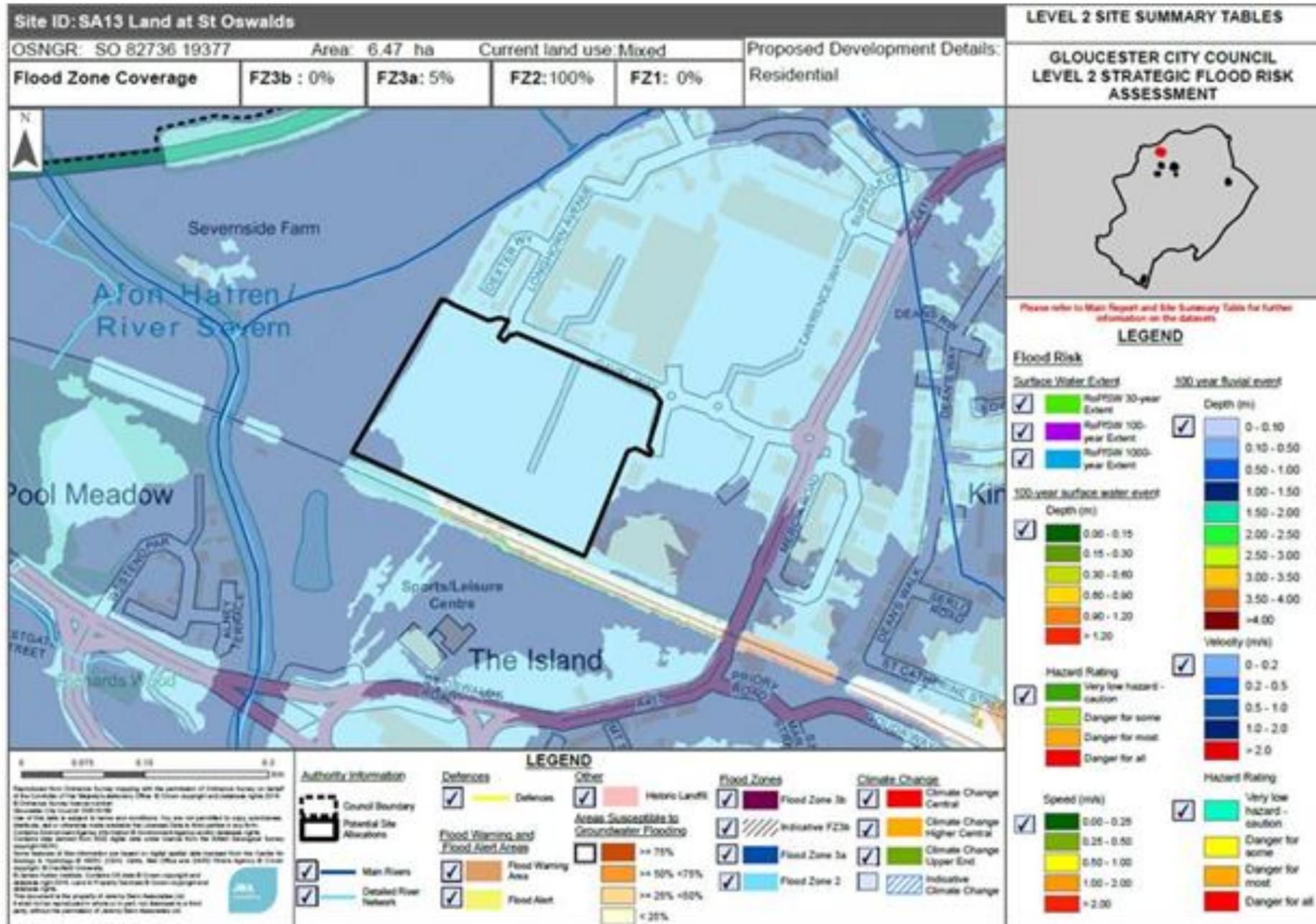


SA09 Former Quayside House



SA13 Land at St Oswalds

SA13 Land at St Oswalds



SA24 Part of West Quay

