

USEFUL REFERENCES FOR DEVELOPERS

1 PURPOSE

This document complements the Level 2 SFRA for Aylesbury. It has been designed to assist developers by directing them to authoritative policy and guidance, highlighting specific sections and giving local information to inform decisions. The text that is in blue and underlined provides hyperlinks to websites. The local information related to Aylesbury is highlighted in yellow boxes. This helps make the document to be confusion-free and easy-to-use.

2 POLICY

The Government's national policy on development and flood risk is clearly set out in the *Planning Policy Statement 25: Development and Flood Risk (PPS25)*, December 2006. A copy of this can be obtained from the Communities and Local Government website:

www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk

Paragraph 5 states a Key Planning Objective:

"The aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall."

3 IMPLEMENTING THE PPS25 POLICY APPROACH

The Government published a *Practice Guide* in June 2008 that complements *PPS25* and explains how to implement the policy approach using a flood risk management hierarchy of:

- Step 1 – Assess
- Step 2 – Avoid
- Step 3 – Substitute
- Step 4 – Control
- Step 5 – Mitigate

The *Practice Guide* also includes case studies to illustrate working examples. A copy of this can be obtained from the Communities and Local Government website:

www.communities.gov.uk/publications/planningandbuilding/pps25practiceguide

4 ROLES AND RESPONSIBILITIES

The responsibility of the developer or landowner is set out in *PPS25* under Paragraphs 22 and 23 (page 8). The Environment Agency's responsibility of is presented in Paragraphs 30 and 31 (page 10). The roles and responsibilities of the flood risk operating organisations and key stakeholders in the planning process are further elaborated in Annex H (page 40-43).

The role of the developer in the planning process in relation to flood risk is well defined in Paragraphs 2.29 to 2.35 (pages 16 and 17) within the *Practice Guide*. Figure 2.5 (page 18)

clearly illustrates the process of taking flood risk into account when preparing individual planning applications. Paragraphs 2.36 to 2.45 (pages 19 and 20) explain the development control role of the Local Planning Authority (Aylesbury Vale District Council).

Further rights and responsibilities of riverside occupation can be found in the Environment Agency's [Living on the Edge](#) (<1MB).
 (<http://publications.environment-agency.gov.uk/pdf/GEHO0407BMFL-e-e.pdf>)

5 THE SEQUENTIAL AND EXCEPTION TEST

The Sequential Test is a decision-making tool that the Aylesbury Vale District Council must use to ensure that sites at little or no risk of flooding are developed in preference to areas at higher risk. The Sequential Test is covered in *PPS25* Paragraphs 16 to 17 (page 7) and Annex D (Paragraphs D1 to D8) along with definitions of Flood Zones 1, 2, 3a and 3b (Table D1) and the classification of development according to flood risk vulnerability (Table D2). The compatibility of development with Flood Zones is illustrated in Table D3. Within the *PPS25 Practice Guide* there is further advice on applying the Sequential Test on:

- Defining the geographical area on which the Sequential Test should be applied – Paragraphs 4.13 to 4.16 (page 70)
- How to consider windfall sites – Paragraphs 4.30 to 4.32 (page 75)
- Individual planning applications – Paragraphs 4.20 to 4.29 (pages 74 and 75)
- Areas requiring redevelopment or regeneration – Paragraphs 4.33 to 4.35 (page 76)
- Redevelopment of an existing single property – Paragraphs 4.36 to 4.37 (pages 76 and 77)

The *Practice Guide* also elaborates on the flood risk vulnerability classification in Paragraphs 4.62 to 4.77 (pages 82 to 84) and the Functional Floodplain in Paragraphs 4.78 to 4.86 (pages 84 to 86).

In exceptional circumstances, there may be valid reasons for a development type to be considered which is not compatible with the level of flood risk at a particular site. Under these circumstances the developer (or Aylesbury Vale District Council) must demonstrate that the development passes all elements of the Exception Test, as set out in *PPS25* Paragraph D9 (page 27). The circumstances are detailed in *PPS25* Paragraphs 18 to 20 (page 7) and Paragraphs D10 to D14 (page 28). The *Practice Guide* holds useful advice on particular aspects:

- Applying it – Figure 4.2 and Paragraphs 4.40 to 4.42 (pages 77 and 78)
- Explaining elements (a), (b) and (c) – Paragraphs 4.43 to 4.46 (page 79)
- Defining 'what is safe?' – Paragraphs 4.47 to 4.61 (pages 79 to 82)

The Environment Agency's knowledge of the floodplain 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. The Aylesbury Town Level 2 SFRA contains the best available information at the present time. After the next update of the Flood Map, the Environment Agency's [website](#) should be used to obtain the best available information on the extents of Flood Zones 2 and 3 – [What's in your backyard?](#) (www.environment-agency.gov.uk/homeandleisure/37793.aspx). However, for information on climate change the Aylesbury Town Level 2 SFRA should still be referred to.

Zone 3b 'the functional floodplain', defined in *PPS25* as the land where water has to flow or be stored in times of flood, is depicted in Figure 6 of the Aylesbury Level 2 SFRA as the 5% annual probability flood extent in addition to the flood storage reservoirs. The functional floodplain is not shown on the Environment Agency's Flood Map.

PPS25 emphasises that only when the sequential approach has been taken, should the Exception Test be applied (pages 7, 18 and 19 of *PPS25*). The flood hazard maps in the Level 2 Aylesbury SFRA for the 5%, 1% and 0.1% annual probability events (present day and with climate change) should be referred to when assessing safe access routes. The maximum permissible hazard on the routes should correspond to the blue areas (depth and velocity combinations in Table 2 of the Level 2 Aylesbury SFRA).

The approach adopted by the Aylesbury Vale District Council is that there should be no built development in Flood Zones 2 and 3 within the Growth Arcs due to the considerable areas available within Flood Zone 1. Development in Flood Zones 2 and 3 should be limited to public open space and, if it passes the Exception Test, essential infrastructure.

For areas of previously developed land in the town and where there is no available land outside of the 0.1% annual probability residual flood risk area, use the Flood Hazard maps to steer water compatible and less vulnerable development to low hazard areas (shown as blue depth-velocity combinations).

6 KEY CONSULTATION

It is recommended to undertake pre-application consultation with flood risk consultees. The *Practice Guide* lists the key consultees in Paragraphs 2.46 to 2.57 (pages 21 to 23).

The Environment Agency is a statutory consultee via the Local Planning Authority in individual planning applications. On its website it provides Standing Advice for developers and their agents on [What you need to do first](http://www.environment-agency.gov.uk/research/planning/82587.aspx).
(www.environment-agency.gov.uk/research/planning/82587.aspx).

7 FLOOD RISK ASSESSMENT (FRA)

The principles of assessing flood risk and minimum requirements in Flood Risk Assessments are listed in Annex E of *PPS25*. The assessment of flood risk is explained in Section 3 of the *Practice Guide*. Particular aspects for developers are:

- The aims of FRAs – Paragraph 3.4 (page 31)
- Sources of flooding – Paragraphs 3.6 to 3.9 (pages 33 to 35)
- The probability of flooding associated with *PPS25* Flood Zones – Figure 3.3 (page 35)
- The consequences of flooding – Paragraphs 3.13 to 3.15 (page 36)
- Types of flood risk assessments – Paragraphs 3.16 and 3.17 (page 37)
- Site-specific flood risk assessment including level of detail – Paragraphs 3.70 to 3.82 (pages 55 to 62)
- Climate change – Paragraphs 3.83 to 3.87 (pages 62 to 63)
- Lifetime of development – Paragraphs 3.88 and 3.89 (page 63).
- Applying the Sequential Test (see above)

Annex B of *PPS25* sets out how to consider climate change. It should be noted that the scenarios of future climate change in the UK are being revised within the UK Climate Impacts Programme (UKCIP). Further details can be found at the following website: www.ukcip.org.uk

There is further Standing Advice from the Environment Agency ([What do I need for my Flood Risk Assessment](http://www.environment-agency.gov.uk/research/planning/93498.aspx) – www.environment-agency.gov.uk/research/planning/93498.aspx) according to the following size of development, the flood risk vulnerability and Flood Zone:

- Non-domestic extensions with a footprint of less than 250 square metres and all domestic extensions
- All applications with a site area less than 1ha
- All applications with a site area greater than 1ha

8 MANAGING SURFACE WATER

Having taken the necessary steps to assess, avoid and substitute flood risk as much as practicable, the surface water to and from the development will need to be taken into account to manage any existing risk and ensure that no new risks are introduced due to increased run off and its treatment or conveyance. Annex F of *PPS25* contains ways to manage surface water including Sustainable Drainage Systems (SUDS). This is expanded in Section 5 of the *Practice Guide* (pages 87 to 105). Particular aspects for developers are:

- The role of the planning system – Paragraphs 5.4 to 5.8 (page 88)
- Managing water at source – Paragraphs 5.9 to 5.13 (pages 88 to 90)
- The role and responsibilities of developers – Paragraphs 5.17 to 5.29 (pages 91 to 93)
- Environmental improvements and issues – Paragraphs 5.30 to 5.31 (pages 93 to 96)
- Site-specific surface water management – Paragraphs 5.43 to 5.50 (pages 101 to 103)
- Further information and references (pages 104 and 105)

The incorporation of integrated SUDS within all developments is welcomed and the methods of sustainable drainage to be used should be considered early on in the planning process as it is more difficult to design a high quality drainage system once the site layout has been set. It is recommended that, until a Surface Water Management Plan has been produced, Growth Arc developers should produce a surface water management strategy that demonstrates the consideration of the whole SUDS scheme, reduces the local surface water flood risk and gives evidence that flood risk elsewhere is not increased. It should be noted that the Environment Agency and the Aylesbury Vale District encourages growth that can demonstrate the reduction of flood risk elsewhere and benefit the wider environment.

The selection of SUDS components is dependent on the site, land use and the required performance. Section 5 of the SUDS Manual (CIRIA, 2007) provides guidance on the selection. In terms of reducing volume or peak flows of runoff, SUDS utilise some form of detention, infiltration into the sub-soil, recycling or re-use. In determining which type of techniques is appropriate, the permeability of the soil is important. All the techniques are compatible with permeable soils, though some may require liners.

The impermeable nature of the ground in many areas around Aylesbury may, however, preclude the use of large scale infiltration as a means of dealing with surface water. According to [Soilscape](#) (2005) from the National Soils Research Institute at a 1:250,000 scale, many of the areas around and in Aylesbury town are composed of “slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils”. Possible locations include the East MDA (between Bierton and the Grand Union Canal), the South-West MDA (south of Walton Court) and the South MDA (south of Elm Farm).

In contrast, there are areas of highly permeable geology where it is important that the water environment is protected from contamination through measures such as oil interceptors in SUDS systems. In the area of the Eastern and the Southern Growth Arcs between Aston Clinton Road and Weston Turville the ground consists of permeable superficial deposits overlying mudstone, a minor aquifer.

There is also an area of highly permeable limestone close to Stoke Brook and Sedrup Ditch (Main Rivers) in the Southern Growth Arc (between Hartwell and Walton Court). According to the Environment Agency, there are no Groundwater Protected Zones within the areas of highly permeable geology that would have restricted certain types of SUDS. However, without protection the water environment is susceptible to contamination in these areas. The ground conditions at each proposed location should be assessed through site specific ground investigations to confirm the types of SUDS appropriate to the site.

All types of SUDS can be used where there are gentle slopes i.e. are more than 1 in 20 slopes (<5% gradient). The majority of Aylesbury's topography is gently sloping, such as St Andrews Way Industrial Estate and the Broughton area. Only retention, infiltration, detention and sources control (green roof and rainwater harvesting) types can perform on steeper slopes of less than 1 in 20 (>5% gradient). Swales, however, can be used on steeper slopes if they follow the contours. Steeper slopes exist northwest of Bierton and Manor Park, as well as in the city centre. Areas greater than 2 hectares should not rely on one single SUDS component.

On new developments, Aylesbury Vale District Council will adopt open watercourses and above ground SUDS features such as swales and wet or dry detention basins, where they are in public open space and do not only serve highway drainage. This policy may be reconsidered in the light of the Government's response to the Pitt Review Recommendation 20, to the effect that County and Unitary authorities should take responsibility. For discussions on adoption and maintenance of SUDS contact Aylesbury Vale District Council.

Long-term frameworks for operation and maintenance of SUDS are contained in the CIRIA report C625 *Model agreements for sustainable water management systems* (2004). Further clarifications on maintenance and adoption methods are expected from the forthcoming Floods and Water Bill. The Berryfields MDA is a successful example of the incorporation of SUDS at the planning stage to manage flood risk and to provide sustainable developments.

It may be required to monitor post development runoff (e.g. flow rates and water quality) as directed by Aylesbury Vale District Council or the Environment Agency. The actual requirements for monitoring (pre-development and post-development frequency and length) should be agreed with Aylesbury Vale District Council and the Environment Agency.

Regional guidance is given by the Environment Agency's Development Control Thames Region (2006) [SUDS - A Practical Guide](#) (<1MB)
www.eastherts.gov.uk/media/pdf/m/3/SUDS_A_Practical_Guide.pdf

Additional references:

- Sustainable Drainage Systems for New Homes – Best Practice Guidance, FLOWS report WP3Cvii-1, Cambridgeshire County Council, 2006
- Environment Agency's website toolkit for [Green Roofs](#) (www.environment-agency.gov.uk/business/sectors/91967.aspx)

9 MANAGING RESIDUAL RISK

Annex G of *PPS25* (pages 36 to 39) sets out how to manage the residual flood risk with reference to development behind existing defences, developer contributions, flood resilience, flood resistance, flood warning and evacuation plans.

The *Practice Guide* makes a distinction between controlling and mitigating the residual risk with Section 6 (pages 106 to 122) focusing on “Risk management by design” to not only ensure development is safe but also not increase flood risk elsewhere. Whereas Section 7 (pages 123 to 134) “Residual risk” only focuses on ensuring development is safe.

Risk management by design focuses on the following options for new development sites, ordered from the most preferred to the least preferred:

- Flood avoidance – Paragraph 6.6 (page 107)
- Site layout – Paragraphs 6.7 to 6.14 (pages 107 to 109)
- Raising floor levels – Paragraphs 6.15 to 6.18 (pages 109 and 110)
- Modifying ground levels – Paragraphs 6.19 to 6.21 (pages 110 and 111)
- Development behind flood defences – Paragraph 6.22 and Figure 6.1 (page 112)
- Upstream flood storage – Paragraphs 6.23 to 6.24 (pages 112 to 114)
- Developer contribution – Paragraphs 6.25 (pages 114 and 115)
- Constructing buildings to be flood resistant, resilient or repairable – Paragraphs 6.26 to 6.35 (Pages 115 to 120)

Developers will have to be able to demonstrate how they have followed this hierarchy and why they have departed from the previous techniques on the list. Any floodplain compensation required should be provided on a level for level and volume for volume basis. There is also guidance on taking climate change into account (page 120) and designing with uncertainty (page 121).

Section 7 explains the characteristics of residual flood risk (Paragraph 7.10, page 124) and aspects to consider when planning development. These include:

- Breaches and overtopping of defences (Paragraphs 7.13 to 7.15, pages 127 to 129)
- Infrastructure acting as a flood defence (Paragraph 7.16, page 129)
- Reservoirs and other artificial water retaining structure (Paragraphs 7.17 to 7.21, pages 129 and 130)
- Other sources – Paragraph 7.22 (page 130)

There is guidance to enable the provision of adequate Flood warnings and the preparation of evacuation plans to ensure new development is safe (*Practice Guide* Paragraphs 7.23 to 7.31, pages 131 to 134).

The flood hazard maps in the Level 2 Aylesbury SFRA for the 5%, 1% and 0.1% annual probability events show the residual risk taking account the existing flood defence measures. In considering the lifetime of the development, the flood outlines with climate change should be used. Within the flood outlines basement developments/ single storey ground flats should only be built if occupants can retreat to higher floor levels above the expected flood level. Development in areas affected by an allowance for climate change should be adaptable e.g. where ground floor use can be changed to less vulnerable/ water compatible types to make space for water. Maximum water levels and flows expected for each flood event can be obtained through the Environment Agency Thames West Customer Contact (see Local Contacts in Section 12 below).

Section 5 of the Aylesbury Level 2 SFRA illustrates the residual flood risk in the event of a defence breach or blocked culvert. A rapid inundation zone has been defined in the Aylesbury Town Level 2 SFRA, based on the rate of floodwater level rise following a breach, where there should be no built development. This rapid inundation zone is not necessarily within Flood Zones 2 or 3, as is the case along the Grand Union Canal.

Additional references:

- Environment Agency (2006) [Guide for developers](#) (14MB)
www.environment-agency.gov.uk/static/documents/1_GETH1106BLNE-e-e(1).pdf
- National Flood Forum “flood resilience through partnership” www.floodforum.org.uk

10 OTHER RELEVANT PLANS AND POLICIES

- [Planning Policy Statement 1: Delivering Sustainable Development](#) (Communities and Local Government, 2005)
- [Planning Policy Statement: Planning and Climate Change - Supplement to Planning Policy Statement 1](#) (Communities and Local Government, 2007)
- [Planning Policy Statement 3: Housing](#) (Communities and Local Government, 2006)
- [Planning Policy Statement 6: Planning for Town Centres](#) (Communities and Local Government, 2005)
- [Planning Policy Statement 12: Local Spatial Planning](#) (Communities and Local Government, 2008)
- Environment Agency Policy and Practice for the Protection of Floodplains (1997)
- Environment Agency Policy regarding Culverts (1999)
- Thames Catchment Flood Management (Environment Agency, July 2008)

11 FUTURE RESOURCES

In order to improve access to general advice about property-level measures, [Defra](#) is planning to develop a website to function as:

- a first port of call for householders and businesses wishing to protect their properties from flood damage; and
- an information resource offering catalogued information to help builders and other professionals stay up-to-date with recent methods and findings.

12 LOCAL CONTACTS

Aylesbury Vale District Council

Customer Service Centre
66 High Street
Aylesbury
Bucks HP20 1SD
Tel: 01296 585 858

www.aylesburyvaledc.gov.uk

Buckinghamshire County Council

Walton Street
Aylesbury
Buckinghamshire
HP20 1UA
Tel: 0845 3708090

www.buckscc.gov.uk

Environment Agency

Thames West, Customer Contact
Red Kite House
Howbery Park
Crowmarsh Gifford
Wallingford
Oxfordshire
OX10 8BD
Tel: 08708 506 506

thwest@environment-agency.gov.uk

www.environment-agency.gov.uk

Thames Water

Customer Services
PO Box 436
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