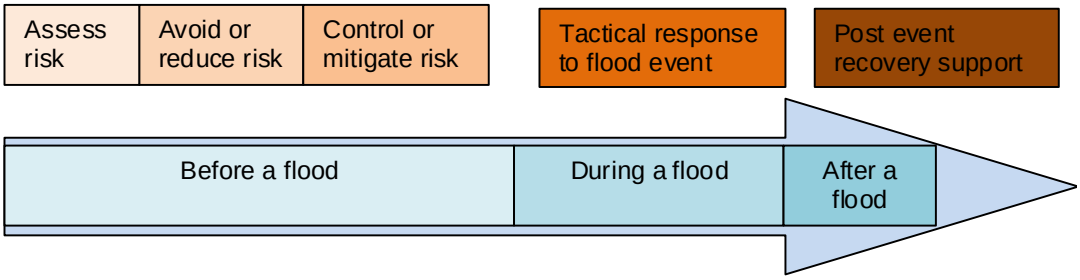
# 6 Recommendations and Guidance

## 6.1 Using SFRA risk information

The SFRA contains information that can be used at strategic, operational and tactical levels as shown in Figure 6.1. The flood risk data contained within this SFRA should be updated following flood events.

**Figure 6.1: Use of SFRA information**




## 6.2 For Adur District and Worthing Borough Councils

One of the key objectives of the SFRA is to provide an evidence base which will inform the preparation of the Local Development Framework for Adur and Worthing with respect to local flood risk issues and the location of future development.

The Councils will have regard to PPS25 Development and Flood Risk and to the most recent Strategic Flood Risk Assessment in assessing the suitability of land for development at all levels of the planning process. It will apply the Sequential Test and Exception Test set out in Annex D of PPS25 in master planning, allocating sites for development and assessing individual planning applications by ensuring that there are no other suitable sites in areas with a lower risk of flooding. The Councils will also have regard to the emerging National Planning Policy Framework and any changes that may bring with it.

The local planning authority can play an important role in strategic flood risk management. The overall aim should be to direct development to areas of lower flood risk wherever possible and resist development in areas of flood risk unless the type of development is commensurate with the type of flood risk.

The Councils should also seek flood risk reduction in every new development and redevelopment through design, changes in land use and drainage requirements.

### 6.2.1 Requirements for flood risk assessment

The Councils should require that all development, including changes of use, have at least an initial assessment of flood risk using this SFRA with a requirement for a detailed site specific flood risk assessment to be submitted with planning applications for:

- Major developments located in Flood Zone 1 (>1ha);
- All development in Flood Zones 2 and 3;
- All development or change of use, regardless of flood zone or size, where flood risk from other sources (surface water, sewer, groundwater) is identified by the SFRA.

Flood Risk Assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed, taking climate change into account.

An FRA should demonstrate:

- whether any proposed development is likely to be affected by current or future flooding from any source;

- satisfying the LPA that the development is safe and where possible reduces flood risk overall;
- whether it will increase flood risk elsewhere; and
- the measures proposed to deal with these effects and risks. Any necessary flood risk management measures should be sufficiently funded to ensure that the site can be developed and occupied safely throughout its proposed lifetime.

### 6.2.2 Surface Water runoff

The Councils should require that surface water runoff from a development should be controlled as close to the source as possible. In addition, where the development site is 'greenfield', runoff must be controlled to maintain the 'greenfield' runoff rates. If the site is 'brownfield' developers should strive to achieve 'greenfield' runoff rates but as a minimum reduce existing runoff by 50%.

The use of Sustainable Drainage Systems (SuDS) should be required on all new developments. If SuDS are not used, the developer must provide a valid reason why they are not suitable.

### 6.2.3 Surface Water flooding

There is a history and recognised risk of surface water flooding in Adur and Worthing (Section 4.4).

The Councils should require a flood risk assessment for all development or change of use, regardless of flood zone or size, where flood risk from surface water is identified by the SFRA. The FRA should clearly state the degree of risk and how the risk to the development will be mitigated against.

Given the level of surface water flood risk in the study area developments should seek to reduce surface water flood risk downstream by capturing the rainwater. Once captured this water should either be:

- Re-used for a range of purposes, such as toilet flushing and garden watering: or
- Infiltrated back to the ground. The permeable nature of the underlying chalk means infiltration is possible, however consultation will be needed with the EA regarding groundwater protection zones (Figure C-6.2: Groundwater source protection zones across Adur and Worthing) as restrictions on infiltration may apply.

### 6.2.4 Groundwater flooding

Situated on the South Downs, the underlying geology of Adur and Worthing is predominantly chalk. Consequently, there is a history and recognised risk of groundwater flooding (Section 4.5).

The Councils should require a flood risk assessment for all development or change of use, regardless of flood zone or size, where flood risk from groundwater is identified by the SFRA. The FRA should clearly state the degree of risk and how the risk to the development will be mitigated against.

The Councils should ensure that any subterranean development proposals consider the risk from groundwater or other sources of flooding, and should prove that groundwater flow paths are maintained so as not to increase the flood risk elsewhere. The design of any new subterranean development should ensure that flood risk is not increased for existing adjacent subterranean developments by changes to groundwater flow paths.

### 6.2.5 Failure of defences

The Adur and Worthing seafront is heavily protected by a series of coastal defences. Although their standard of protection is high, there remains a residual risk in the incidence of failure (Section 4.3.5). There is also a risk of defence failure along the length of the River Adur which has raised defences along both banks throughout Adur.

Where flood risk exists from failure of defences, all developments should be required to demonstrate that:

- 'Safe' access includes the ability to escape to higher levels without having to pass through flood waters.
- The Councils' emergency planner is consulted on the proposals.
- The emergency services are consulted on the proposals.
- A robust emergency/evacuation plan should be developed and communicated.
- The development would be structurally safe against the effects of breach flood waters.
- For major highly vulnerable development and essential infrastructure safety will also need to be ensured through demonstration that a robust evacuation plan to dry land is developed.

### 6.2.6 Wave overtopping

Wave overtopping is a significant risk along the south coast. Wave overtopping is one of the principal mechanisms of flooding for the coastal frontage (Section 4.3.5). In line with the approach agreed for the recent Arun to Adur Flood Risk Mapping Study, wave overtopping has been considered in this SFRA update within the assessment of actual risk or residual risk, not within the flood zone delineation. This approach balances the predominance of redevelopment and regeneration in the coastal frontage of the study area with the need to consider flood risk from all sources. Allowing for wave-overtopping increases the extent of flooding. In some instances, this can mean the defended 1 in 200 year outline with the effect of wave overtopping would be larger than Flood Zone 3a. Therefore, any future development proposal along the coastal frontage should be required to thoroughly consider the effects of wave overtopping through detailed hydraulic modelling.

Where flood risk exists from wave overtopping, all developments should be required to demonstrate that:

- The residual risk is being mitigated.
- The development would be structurally safe.
- The development has 'Safe' access and egress to dry land, or includes the ability to escape to higher levels without having to pass through flood waters.
- Both the Council's emergency planners are consulted on the proposals.
- The emergency services are consulted on the proposals.
- A robust emergency/evacuation plan should be developed and communicated.

### 6.2.7 Functional Floodplain

Section 4.3.2 detailed the approach to functional floodplain in the Adur and Worthing plan areas. In line with the discussions in Section 4.3.2, where the question of functionality arises then it will be the responsibility of the developer to challenge this designation through detailed hydraulic modelling.

## 6.3 For Developers

Developers should consider flood risk at an early stage in deciding the layout and design of a site to provide an opportunity to reduce flood risk within the development. Recommendations of how to reduce flood risk through design and site layout are detailed in Appendix C.1.

In general all future developments should demonstrate:

- That the probability and consequences of flooding will be reduced.
- How actual and residual flood risk to the development and flood risk to others from all sources will be managed over the lifetime of the development, taking into account climate change.
- That development will be safe through the layout, form and floor levels of the development and mitigation measures.
- Surface water runoff is being managed.

A development will have certain requirements to fulfil, dependent upon which flood zone it is located within. The minimum requirements for future development are summarised Appendix D.

The following subsections contain information to assist developers where flood risk to and from a development is identified.

### 6.3.1 Managing surface water runoff

As standard, SuDS techniques should be used on all new developments to control the surface water runoff from the site. Any surface water runoff from a development should be controlled as close to the source as possible. Details of application of SuDS techniques can be found in Appendix C.3.

Where the development site is 'greenfield', runoff must be controlled to maintain the 'greenfield' runoff rates. If the site is 'brownfield' developers should strive to achieve 'greenfield' runoff rates but as a minimum reduce existing runoff by 50%.

### 6.3.2 Managing flood risk from sewer flooding

There should not be the presumption that the existing sewer drainage network has enough capacity to accommodate the flows from new developments. Consultation with Southern Water Services Ltd should be undertaken prior to development commencing. (See Appendix C.2)

Where there is an evidenced history of sewer flooding in an area, resilience measures e.g. non return valves should be considered in development design.

### 6.3.3 Managing flood risk from surface water flooding

Where a site is shown to be at risk of surface water flooding the design and layout of the property should be such that the risk is reduced.

Where risk remains, the likely flow routes and depths across the site should be modelled. The site should be designed so that these flow routes are maintained, and building design should provide resilience against the risk of surface water flooding. (Appendix C.1 details potential resilience measures).

Developments should seek to reduce surface water flood risk downstream by capturing the rainwater. Once captured this water should either be:

- Re-used for a range of purposes, such as toilet flushing and garden watering: or
- Infiltrated back to the ground. The permeable nature of the underlying chalk means infiltration is possible. However, consultation will be needed with the Environment Agency's groundwater protection zones (Figure C-6.2) as restrictions on infiltration may apply.

At the present time there is no policy for what constitutes the thresholds for ‘locally significant flood risk’. This policy will be determined and set out in West Sussex’s Local Flood Risk Management Strategy (LFRMS) which is due to start later in 2011. The West Sussex LFRMS will collect and assess information on surface water , groundwater and ordinary water courses flood risk of local significance and will map flood hazards and flood risk of local significance, as well as considering a flood risk management plan for the county. For example, the PFRA process has identified 2631 incidents of past local flooding within the county. These areas will be addressed in the LFRMS.

### 6.3.4 Managing flood risk from groundwater flooding

Groundwater flooding has a very different flood mechanism to any other form of flooding. As it rises up from below ground level, many conventional flood defence and mitigation methods are not suitable. A large proportion of the county has the potential to be affected by emergent groundwater due to its underlying geology, current modelling is not detailed enough to accurately predict where flooding may occur. Further analysis of this flood source will be investigated in the LFRMS.

The only way to fully reduce flood risk would be through building design, ensuring that floor levels are raised above the water levels caused by a 1% annual probability plus climate change event. Site design would also need to preserve any overland or subterranean flow routes followed by the groundwater and make sure flood risk is not increased elsewhere.

Where subterranean development is proposed the developer will need to ensure there is no risk from groundwater (or other sources of flooding). The development will also need to ensure no underground groundwater flow paths are impeded, so as not to increase the flood risk to existing adjacent basements by changes to groundwater flow patterns.

When redeveloping existing buildings it may be acceptable to install pumps in basements as a resilience measure. However for new development this is unlikely to be considered an acceptable solution.