

Guidance for New Development in Flood Risk Areas (More Vulnerable Development)



Introduction

This document aims to provide guidance on what needs to be included in a site specific Flood Risk Assessment. It also provides the LPA and developers specific guidance on the issues that need to be considered when developing in flood risk areas.

We would recommend that applicants discuss proposals fully both with the Environment Agency and Gosport Borough Council at the pre-application stage.

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FRA Guidance

Flood risk assessment should be in line with PPS 25 Annex E 'The Assessment of Flood Risk'. All development should try to keep to the Flood Risk Management Hierarchy detailed in PPS 25 Practice Guide. Sequential test and Exception test will always apply where appropriate as per PPS25 and the development should be in line with the Flood Risk Management Hierarchy i.e. assess, avoid, substitute, control & mitigate.

It will be important for the FRA to describe clearly the characteristics of flooding which include:

- The worst case flooding scenario to which the development or users would be exposed (i.e. depths and velocities)
- How the flood propagates (i.e. how quickly the flood spreads, the routes etc).
- Duration (i.e. how long the flood water stays around on site)
- The frequency in which the development will be exposed to flooding

New development should be designed for any flooding that may occur throughout its lifetime and be able to cope with the flooding effects described.

When dealing with control and mitigation the following guidance will apply to new development:

Type of Development	Flood Risk Issue	Measures to consider
More Vulnerable (residential)	Internal Flooding	Finished floor levels to be set above the worse case design flood level plus suitable freeboard. Single storey dwelling finished floor levels should be above extreme level. It is acceptable for garages and car parking areas to flood if they are resilient and resistant to flooding.
	Access and egress	<p>The maximum flood hazard on access/egress routes to a place of safety away from the flooding should not exceed the depth and velocity combinations associated with a 'very low hazard' in table 13.1 of FD2320. Access routes should allow occupants to safely access and exit their dwellings in design flood conditions. (Paragraph 4.60 of the PPS25 Practice guide - December 2009)</p> <p>To achieve this the following hierarchy should be followed:</p> <ol style="list-style-type: none"> 1. Raise access routes (if routes are submerged consideration will need to be given to underwater obstacles such as grills, steps and hazards) 2. Defend access routes to appropriate standard (after considering the effects of such actions on third parties) <p>If this standard cannot be met it will be necessary for users of the development to avoid flood hazards through the use of a flood plan and associated actions by providing:</p> <ol style="list-style-type: none"> 3. Flood warning & evacuation plans (see section below) 4. Reliance on temporary refuge (see section below) <p>The FRA will need to provide clear evidence i.e. options appraisal which demonstrates to the LPA how the above hierarchy has been followed.</p> <p>The FRA is to provide information on flood hazard along access/egress routes during the extreme flood event so that the LPA can make a judgement as to whether this is acceptable in light of the timeframe over which people might be trapped, the quality of the temporary refuge provided and the capability of emergency services to effect a rescue and the advice of the particular authorities, operators, utilities and regulators as appropriate. Access considerations should include the voluntary and free movement of people during a design flood, as well as the potential for evacuation before a more extreme flood (Paragraph 4.59 of the PPS25 Practice guide - December 2009).</p>
	Structural Integrity of Buildings	<p>Buildings to be structurally sound and remain in situ during the worst case flooding effects (depth and velocity). Any measures in place to ensure structural soundness during a flood should not cause a hazard to people. These measures should be covered in the FRA.</p> <p>Note: the decision as to what is or is not appropriate rests with the LPA in consultation with other professionals they may wish to consult on the issue e.g. Building Control before planning is approved. We therefore recommend that developers speak to officers in the Building Control Partnership at a pre-application stage to establish whether this is likely to be a key issue for consideration.</p> <p>When considering safety, specific local circumstances need to be taken into account, including - the structural safety of the building. (PPS25 practice guide December 09 paragraph 4.57).</p>

	<p>For more details please refer to Improving the Flood Performance of new Buildings: Flood resilience construction, Communities and Local Government, 2007.</p>
Rescue Routes (Emergency Services Personnel)	<p>Vehicular access to allow the emergency services to safely reach the development during design flood conditions will normally be required. (Paragraph 4.60 of the PPS25 Practice guide - December 2009). The FRA should consider this point.</p> <p>Note: the decision as to what is or is not appropriate rests with the LPA in consultation with its own professionals having both consulted and agreed procedures with those Emergency Services within their area.</p>
Resistance & Resilience Measures	<p>Buildings to be appropriately flood free/ resistant /resilient / repairable from the worst case flooding effects and the frequency of which flooding occurs. This applies to all sources of flooding. Internal services should remain capable of operation during & immediately after the worst case flooding effects from all sources.</p> <p>FRA to demonstrate if the facility can remain operational during the worst case flooding effects (depth and velocity) experienced from all sources of flooding.</p> <p>Note: the decision as to what is or is not appropriate rests with the LPA in consultation with other professionals they may wish to consult on the issue e.g. Building Control.</p>
Off Site Flood Risk	<p>Surface water to be managed according to sustainable drainage principles, with the aim of not increasing, and where practicable, reducing the rate of runoff from the site as a result of the development.</p> <p>FRA to demonstrate no detrimental impact on third parties resulting from displaced water caused by loss of flood storage capacity or obstructed flood flows. For example, alterations to ground levels or raising flood embankments.</p> <p>All forms of flooding should be considered.</p>
Site specific flood plan	<p>Where essential to safety the flood plan should include details of how users of the site can avoid being placed in danger from flood hazards. For example, through the use of prior evacuation. The flood response plan is to be consistent with the area flood emergency and resilience plans. The FRA is to provide information on the flooding effects (depth and velocity) experienced throughout the flood.</p> <p>The flood response plan should detail appropriate measures to ensure that occupiers are aware of actions to take - this could include signage and other visible markers such as intuitive landscaping.</p> <p>Where there is a need to remain operational the flood response plan should link to actions undertaken by users of the development in relation to safety.</p> <p>Note: the decision as to what is or is not an appropriate emergency plan rests with the LPA in consultation with other professionals they may wish to consult on the issue e.g. Emergency Planning Officers.</p> <p>One of the considerations to ensure that any new development is safe is whether adequate flood warnings would be available and that people using the development will act on them, to keep safe. Depending on the nature of the</p>

		<p>development and the severity of flooding, this may entail retreating to a safe place of refuge within the development, leaving the development by a signed safe access route to dry ground beyond the flooded area, or preparing for rescue by the emergency services to safe locations previously identified by the local authority in their emergency planning role (PPS25 practice guide December 09 paragraph 7.25).</p> <p>There are existing Emergency Reception Rest Centres within the borough including Thorngate Hall, HEDCA, Lee-on-the-Solent Community Centre and Nimrod Drive.</p> <p>The Site Specific Flood Plan should be part of the FRA and guidance is provided on the following link: www.gbcbloodplanguidance.co.uk</p>
	<p>Temporary refuge</p>	<p>Temporary refuge will need to be available for users of the site unless access to a place of safety away from the flooding is available e.g. flood zone 1.</p> <p>Refuge to be flood free from the worst case flood depth. The quality of the refuge (provision of facilities, communication, warmth etc.) is to reflect the timescale that people would be trapped.</p> <p>Note: the decision as to what is or is not an appropriate refuge rests with the LPA in consultation with other professionals they may wish to consult on the issue e.g. Emergency Planning Officers.</p> <p>Safe refuge above flood level should be designed into new developments within flood risk zones (PPS25 practice guide December 09 paragraph 6.18)</p>

Appendix 1: Definitions

Worst case flooding: Flood risk should be assessed in line with PPS25 requirements. In the majority of cases the flood risk assessment should detail the worst flooding effects to impact the site at any time in a development's lifetime, from a 1% fluvial or 0.5% tidal flood. In defended areas this would normally be taken as a failure (breach) or overtopping of flood defences during a 1% fluvial or 0.5% tidal flood.

Consideration of the more extreme 0.1% flood may also be required in some instances as a way to sensitivity test any flood mitigation proposed or in relation to emergency planning activities.

Worst case flooding from **other flood sources** should be based on the best information available at the time.

Design Flood Event:

Sea: The 0.5% tidal event at the end of the development lifetime including climate change.

Rivers: The 1% fluvial event at the end of the development's lifetime including climate change.

Design Flood Level: The maximum estimated water level that will be reached during the design flood event, taking into account any formal or informal flood risk infrastructure where applicable.

Extreme Flood Event: Sea & River: The 0.1% event at the end of the development's lifetime including climate change

Lifetime of Development: PPS 25 Practice Guide (December 2009) gives guidance on residential development being considered for a minimum of 100 years, unless there is specific justification for considering a shorter period (i.e. if the development was controlled by a time limited planning condition). (section 3.102)

Section 3.103 states for other development other than residential, its lifetime will depend on the characteristics of that development. The LPA should use their experience within their locality to assess how long they anticipate the development being present for. Developers should justify why they have adopted a given lifetime for the development when they are formulating their FRA. This should all be agreed between the developer / LPA and Environment Agency.

Other Sources of Flooding: PPS 25 states that the FRA should identify and assess the risks of all forms of flooding to an from the development and demonstrate how these flood risks will be managed, taking climate change into account. Therefore surface water flooding, groundwater flooding and sewer flooding should all be considered in the FRA.

Freeboard: The difference between finished floor levels of habitable rooms and the design flood level. Finished floor levels should always have a sufficient freeboard allowance and this should be agreed between the developer, LPA and Environment Agency.

Undefended Site: A site which does not benefit from any formal or informal flood risk infrastructure i.e. flood defence walls, raised embankments, variations in natural topography etc

Defended Sites: A site which benefits from formal or informal flood risk infrastructure

Access & Egress: Routes suitable for movement of people of all mobilities both to the site boundary and to local facilities including shops, schools, doctors' surgeries and buildings likely to be used as places of assembly during flooding. Refuge sites should be identified.

Residual Risk: The risk which remains after all risk avoidance, reduction and mitigation measures have been implemented. For example, after building a wall or embankment to protect a development site, what are the chances and the potential consequences if that wall or flood defence fails?

Standard of Protection: The design event or standard to which a building, asset or area is protected against flooding, generally expressed as an annual exceedance probability.

Rescue: the recovery of people from imminent danger, or place of temporary refuge when flood water has inundated an area. The key determinant in defining an activity as a rescue is whether it requires specialist trained and equipped teams to recover casualties and take them to a "*place of safety*", not the immediacy of the action or level of risk involved.

Evacuations: involve the movement of people, either through their own efforts or with the assistance of others, to a "*place of safety*" without the need for specialist trained and equipped rescuers'. By definition, this describes activities which take place before an area is inundated by flood water.

A temporary refuge: is any place or structure where individuals trapped by flood water can remain for a short period in relative safety whilst awaiting the flood to recede.

A place of safety: can be defined as a place where people are no longer in danger from flood water and can freely access essential services or disperse without the need for specialist assistance, i.e. rescue boats or helicopters.