

Hinckley and Bosworth Borough Level 2 Strategic Flood Risk Assessment: Detailed Site Summary Tables



Site details	Site Code	Site LPR16 – Land east of Lutterworth Road, Burbage			
	Area	236.1 hectares			
	Current land use	Greenfield			
	Proposed land use	Residential			
Sources of flood risk	Existing drainage features	<p>The Soar Brook flows from west to east across the centre of the site. Before the eastern boundary it is joined by an unnamed watercourse and flows east to the site boundary where it joins the River Soar.</p> <p>Another unnamed watercourse flows from south to north along the south-eastern site boundary, joining the Soar Brook to form the River Soar. An additional channel runs from south to north 100 – 160 m from the site boundary before re-joining the unnamed tributary.</p> <p>A further channel runs from southwest to northeast through the centre of the southern site past Hogue Hall to join the Soar Brook.</p> <p>At the northern end of the site, an unnamed tributary of the Soar Brook runs from northwest to southeast across the site and then along the north-eastern site boundary.</p>			
	Fluvial	Proportion of site at risk			
		FZ3b	FZ3a	FZ2	FZ1
		6%	6%	8%	92%
	<p>Flood risk is primarily concentrated along the watercourses along the northern and eastern boundaries of the site, and through the centre of the site along the Soar Brook, bisecting the site. The largest extent of fluvial flooding occurs in the area surrounding the confluence of the Soar Brook and its tributaries and where the Soar Brook meets the River Soar. Some of the smaller watercourses within the site, including the watercourse flowing past Hogue Hall, and the sub-channel in the southeast of the site are not included in the Flood Zones due to their size; however, could still pose a fluvial flood risk to the site. This should be considered for modelling as part of a Flood Risk Assessment.</p>				
	Surface Water	Proportion of site at risk (RoFfSW)			
30-year		100-year	1,000-year		
2%		4%	10%		
<p>Surface water flood risk is mainly found along and flowing towards the watercourses within the site. In the 30-year and 100-year events surface water flooding is mostly found within channels or surrounding the confluence of Soar Brook and its tributary, and Soar Brook and the River Soar. Surface water flooding encroaches further west into the site from the eastern boundary in 1,000-year event. There are some isolated areas of ponding in the north-western area of the site in all events.</p>					
Reservoir	The site is not shown to be at risk of reservoir flooding.				
Flood history	There are no records of historic flooding at the site from Leicestershire County Council or the Environment Agency historic flooding map.				
Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition	
		-	-	-	
This site is not protected by any formal flood defences.					

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	Residual risk	-			
Emergency planning	Flood warning	The site is not covered by the Environment Agency's Flood Warning Service.			
	Access and egress	<p>Dry access and egress is available via the A5 from the south-east in all fluvial events travelling west along the A5, and in all surface water events leaving the A5 via the B4114. This access could be prevented during fluvial events if the culvert under the A5 at the southern tip of the site becomes blocked and water floods onto the highway.</p> <p>Dry access and egress is available to the area of the site north of Soar Brook along most of Lutterworth road in all fluvial events and in the 30-year and 100-year surface water events. Access to Lutterworth Road from the north is more restricted in the 1,000-year surface water event due to small areas of ponding.</p> <p>The depths, velocities, hazards, durations and speeds of onset of surface water and fluvial flooding along access/ egress routes should be investigated further in a site-specific assessment, to confirm whether access for emergency vehicles could still be obtained.</p>			
Climate Change	Climate change allowances for '2080s'	River Basin District	Central	Higher Central	Upper End
		Humber	20%	30%	50%
	Implications for the site	Fluvial extents from climate change did not increase significantly when compared with FZ3a. Minor increases can be seen where the Soar Brook crosses the middle of the site. As the site is affected by surface water flooding from the 100-year event, climate change may also increase the extent, depth and frequency of surface water flooding. The 1,000-year surface water extent can be used as an indication of surface water climate change extents.			

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Requirements for drainage control and impact mitigation	Broad scale assessment of possible SuDS	<ul style="list-style-type: none"> • Geology at the site consists of: <ul style="list-style-type: none"> ○ Bedrock – Mudstone, siltstone and sandstone ○ Superficial – Diamicton in the central area of the site. Sections of glacial sand and gravel in the west and south and an area of clay, silt and sand in the east. • The site is not located within a Groundwater Source Protection Zone. • Most source control techniques are likely to be suitable. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater. • Infiltration may be suitable. Mapping suggests a medium risk of groundwater flooding and underlying soils may be permeable. Further site investigation should be carried out to assess potential for drainage by infiltration. If infiltration is suitable it should be avoided in areas where the depth to the water table is <1m. • Mapping suggests that the site slopes are suitable for all forms of detention. A liner maybe required to prevent the egress of groundwater. • All filtration techniques are likely to be suitable. A liner maybe required to prevent the egress of groundwater. • All forms of conveyance are likely to be suitable. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the egress of groundwater. • The site is not designated by the Environment Agency as previously being a landfill site. • should refer to latest SuDS guidance on Leicestershire County Council's website and Environmental Best Practice notes as well as the Level 1 SFRA, for information on suitable types of SuDS, the management train and opportunities and constraints.
NPPF and planning implications	Exception Test requirements	<p>The Sequential Test will need to be passed before the Exception Test is applied.</p> <p>The Exception Test will need to be applied if:</p> <ul style="list-style-type: none"> • 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. <p>Residential development is classified as 'More Vulnerable'.</p>

	<p>Requirements and guidance for site-specific Flood Risk Assessment</p>	<ul style="list-style-type: none"> • Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage. • At the planning application stage, a site-specific Flood Risk Assessment will be required if any development is located within Flood Zones 2 or 3 or is greater than one hectare. A Flood Risk Assessment must consider the entire lifetime of the development and consider all sources of flooding. • The site area includes the Flood Zone 2 extents. Most development types are appropriate for this flood risk zone but must take into account the flood risk (1% to 0.1% annual exceedance probability). • The site area includes the Flood Zone 3a extents. Future development must take into account the flood risk in this area (5% to 1% annual exceedance probability). More vulnerable and critical infrastructure development is possible within Flood Zone 3a but is required to pass the Exception Test. Highly vulnerable development is not permitted within Flood Zone 3a. • The site area includes the extents of Flood Zone 3b, also known as the functional floodplain. Only essential infrastructure passing the Exception Test is permitted within Flood Zone 3b. Should there be any development within Flood Zone 3b flood storage lost by the development must be offset. • An ordinary watercourse is within or immediately adjacent to the site area and therefore consultation with Lead Local Flood Authority should be completed. If alterations or discharges are proposed to the watercourse a land drainage consent will be required. • Some of the smaller watercourses within the site, including the watercourse flowing past Hogue Hall, and the sub-channel in the southeast of the site are not included in the Flood Zones due to their size; however, could still pose a fluvial flood risk to the site. This should be considered for modelling as part of a Flood Risk Assessment and may require more detailed hydraulic modelling to confirm risk where 2D generalised modelling is currently available. • Resilience measures will be required if buildings are situated in the flood risk area through the centre of the site's boundary. Raising Finished Floor Levels above the design event may remove the need for resilience measures. • Onsite attenuation schemes would need to be tested against the Soar Brook through the centre of the site and River Soar along the site boundary to ensure flows are not exacerbated downstream within the catchment. • New or re-development should adopt exemplar source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. • Water quality requirements for sustainable development should comply with current SuDS guidance. • Assessment for runoff should include allowance for climate change effects. • Safe access and egress will need to be demonstrated. • New development must seek opportunities to reduce overall level of flood risk at the site, for example by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding.
Mapping Information		
<p>Flood Zones</p>	<p>Flood Zones 2 and 3a have been taken from the Environment Agency's Flood Map for Planning Flood Zones (eastern site border) and 2D generalised modelling techniques (elsewhere within the site). Flood Zone 3b has been derived from 2D generalised modelling techniques for the majority of the site and Flood Zone 3a has been used as a conservative indication of Flood Zone 3b for the watercourse along the eastern site boundary.</p>	

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Climate change		The climate change allowances for the '2080s' epoch were modelled using 2D generalised modelling techniques for the majority of the site. Flood Zone 2 has been used as a conservative indication of climate change for the watercourse along the eastern site boundary.
Surface Water		The Environment Agency's Risk of Flooding from Surface Water has been used to define areas at risk from surface water flooding.
Fluvial depth, velocity and hazard mapping		Depth, velocity and hazard mapping for the 1 in 100-year event (Flood Zone 3a) have been taken from 2D generalised modelling techniques.
Surface water depth, velocity and hazard mapping		The surface water depth, velocity and hazard mapping for the 1 in 100-year event (considered to be medium risk) is taken Environment Agency's Risk of Flooding from Surface Water.