

# Shropshire Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>ELL005 and ELL008 and ELL033</b>			
	<b>Address</b>	Adjacent to A495, Ellesmere			
	<b>Area</b>	9.5 hectares			
	<b>Current land use</b>	Greenfield			
	<b>Proposed land use</b>	Residential			
<b>Sources of flood risk</b>	<b>Location of site within catchment</b>	The site is located in the Newnes Brook catchment, a tributary in the upper catchment of the River Perry. It is on the south-western edge of the town of Ellesmere. The north-east of the site lies at higher topography with the ground sloping down to lower ground in the southwest of the site. The topographic characteristics of the site may lead to localised ponding of flood waters in the areas of lower elevation in the south and west of the site.			
	<b>Existing drainage features</b>	The Newnes Brook bisects the site, flowing from northeast to southwest in the central area of the site. According to the Detailed River Network (DRN) dataset, the section of the Brook running across the site is culverted, entering the culvert as the Brook flows southwards beneath the A495 and emerging from the culvert where the watercourse leaves the site at the southern boundary. An open section of the watercourse then flows southwards along the site boundary from this culvert outlet.			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>			
		<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
		7%	7%	10%	90%
		<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>			
High					
<i>The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%)</i>					

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		<p><b>Available data:</b> The Environment Agency's Flood Zone mapping has been used in this assessment. This is based on 2D generalised modelling data.</p> <p><b>Flood characteristics:</b> Fluvial flood risk is primarily associated with the Newnes Brook that bisects the site from north to south in its central area. Flood Zones 2 and 3 extend westward from the course of the Newnes Brook into the south-western area of the site, largely confined and steered by the low-lying topography. The Newnes Brook goes into culvert north of Scotland Street but Flood Zone extents continue to follow the topography and indicative path of the watercourse through the site. The watercourse and low topography continue south to Tetchill Brook. More detailed hydraulic modelling may refine flood extents in this area, accounting for the culvert and confirming whether the watercourse exits the culvert in the vicinity of the site, or whether this is further south, which is not clear from OS mapping.</p> <p>The Environment Agency's Risk of Flooding from Rivers and Sea dataset shows that this site is partially covered by an area of predominantly high risk in the low-lying topography in the southwest of the site. This suggests that flooding at the site has an annual exceedance probability of 3.3%. The northeast area of the site, which lies at higher topography, is not impacted by fluvial flood risk.</p>		
	Surface Water	<b>Proportion of site at risk (RoFfSW)</b>		
		<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>
		0%	0%	1%
		Max depths (m)		
		n/a	n/a	0.3-0.9
		Max velocity (m/s)		
		n/a	n/a	<0.25
		<p><i>The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 100-year includes the 30-year %)</i></p>		
	<p><b>Description of surface water flow paths:</b> There are isolated areas of surface water ponding associated with the 1,000-year event close to the Newnes Brook in the centre of the northern boundary and in areas of low topography in the southwest of the site, but in general surface water is not posing a risk to the site.</p>			
Reservoir	The site is not shown to be at risk of reservoir flooding from the available <a href="#">online</a> maps.			
Flood history	There are no records of historic flooding at the site from the Environment Agency or Shropshire Council.			

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<b>Flood risk management infrastructure</b>	<b>Defences</b>	<b>Defence Type</b>	<b>Standard of Protection</b>	<b>Condition</b>
		-	-	-
	This site is not protected by any formal flood defences.			
	<b>Residual risk</b>	The Newnes Brook enters a culvert flowing beneath Scotland Street to the north of the site. More detailed modelling would help to confirm if there would be any residual risk from this culvert overtopping Scotland Street. However, the A495 is slightly embanked to the north of the site between the culvert inlet and the northern site boundary which could prevent flood waters passing onto the site via overground routes.		
<b>Emergency planning</b>	<b>Flood warning</b>	The site is partially covered by the Environment Agency's Flood Warning Service, via a Flood Alert Area. The name of the Flood Alert Area is 031WAF104 Tern and Perry Catchments. There is no Flood Warning Area at the site.		
	<b>Access and egress</b>	Safe access and egress to the entire site is available via the A495 Scotland Street from the southwest in all fluvial and surface water events. Flood Zone 2 and 3a extend slightly across the A495 further east along Scotland Street but this is not significant. Additionally, there are a number of isolated areas of ponding in all events along the A495 to the northeast of the site. However, the maximum depth of this surface water is estimated to be 0.3-0.9m, so access is likely not impeded. There is potential that any flooding associated with the Newnes Brook bisecting the centre of the site could prevent movement between the north-east and south-west areas of the site; however, safe access and egress to both areas of the site can be gained via external routes so emergency services will likely be able to gain access to the entire site. 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.		

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<b>Climate Change</b>	<b>Implications for the site</b>	<ul style="list-style-type: none"> <li>Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding.</li> <li>There is no detailed fluvial modelling available at the site, and therefore Flood Zone 2 has been used as a conservative indication of flood risk from climate change. Consequently, flood risk extends westwards away from the Newnes Brook into the low-lying areas in the south-west of the site in addition to a small area close to the northern boundary of the site, also in low-lying topography. As part of a site-specific Flood Risk Assessment, latest EA climate change allowances will need to be considered in a detailed hydraulic model, to confirm the impact in the site.</li> <li>Climate change also needs to be considered for surface water events; at the site-specific stage, the 100-year +40% event is considered as part of surface water drainage strategies, or surface water modelling.</li> <li>The current day 1,000-year surface water extent provides an indication of the likely increase in extent of the more frequent events. This would require a detailed FRA to assess the site layout and design.</li> <li>Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.</li> </ul>	
<b>Cumulative Impact of development within the catchment</b>	<b>Level of risk</b>	<b>Catchment</b>	<b>Level of risk</b>
		Tetchill Brook	Low
	The Tetchill Brook catchment, a sub-catchment of the River Perry, has been identified as one with a low sensitivity to the cumulative impact of development within the catchment.		
	<b>Recommendations</b>	N/A	

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<b>Requirements for drainage control and impact mitigation</b>	<b>Broad scale assessment of possible SuDS</b>	<ul style="list-style-type: none"> <li>• Geology at the site consists of: <ul style="list-style-type: none"> <li>○ Bedrock: Wilmslow Sandstone Formation - Sandstone.</li> <li>○ Superficial: Till - Diamicton.</li> </ul> </li> <li>• The site is not located within any Environment Agency designated Source Protection Zone.</li> <li>• All forms of source control are likely to be suitable.</li> <li>• Infiltration likely to be suitable. Mapping suggests a low risk of ground water flooding however, site investigations should be carried out to assess potential for drainage by infiltration.</li> <li>• Mapping suggests that the site slopes are suitable for all forms of detention.</li> <li>• All filtration techniques are likely to be suitable. If the site has contamination issues; a liner will be required.</li> <li>• All forms of conveyance are likely to be suitable. Where the slopes are &gt;5% features should follow contours or utilise check dams to slow flows. If the site has contamination issues; a liner will be required.</li> <li>• The site is not designated by the Environment Agency as previously being a landfill site.</li> <li>• Developers should refer to Shropshire Council's '<a href="#">Surface Water Management: Interim Guidance for Developers</a>' and '<a href="#">SuDS requirements for new developments</a>' webpage as well as the Level 1 SFRA, for information on suitable types of SuDS, the management train and opportunities and constraints in site master-planning.</li> </ul>
<b>NPPF and planning implications</b>	<b>Exception Test requirements</b>	<p>The Local Authority have carried out the Sequential Test in line with national guidance. The Sequential Test will need to be passed before the Exception Test is applied. Residential development is classified as 'More Vulnerable'. It is recommended that proposed development will be sequentially located within Flood Zone 1 areas of the site.</p> <p>The Exception test will need to be applied if:</p> <ul style="list-style-type: none"> <li>• More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2.</li> <li>• Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b.</li> <li>• More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b.</li> </ul>

	<p style="text-align: center;"><b>Requirements and guidance for site-specific Flood Risk Assessment</b></p>	<p><b>Flood Risk Assessment:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• All sources of flooding, particularly the risk of surface water and groundwater flooding, should be considered as part of a site-specific flood risk assessment.</li> <li>• A more detailed hydraulic model may be required at Flood Risk Assessment stage, to confirm flood risk, FZ3b, climate change extents, using channel topographic survey. This survey will also confirm the location of the culvert exit.</li> <li>• Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; Shropshire Council's Local Plan policies, and the LLFA's '<a href="#">Surface Water Management: Interim Guidance for Developers</a>' and '<a href="#">SuDS requirements for new developments</a>' webpage.</li> <li>• Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.</li> <li>• The development should be designed using a sequential approach. Development should be steered away from areas of fluvial flood risk and surface water flow routes, preserving these spaces as green infrastructure. Development must be in line with Table 3: flood risk vulnerability and flood zone compatibility of the NPPG.</li> <li>• Development in FZ3b should be avoided unless appropriate use can be demonstrated in line with NPPF.</li> <li>• Development in FZ3 may require floodplain compensation and this should be confirmed with the EA at FRA stage.</li> </ul> <p><b>Guidance for site design and making development safe:</b></p> <ul style="list-style-type: none"> <li>• The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).</li> <li>• Safe access and egress will need to be demonstrated in the 1 in 100-year plus climate change fluvial and rainfall events, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.</li> <li>• Resilience measures will be required if buildings are situated in the flood risk area. Raising Finished Floor Levels above the design event may remove the need for resilience measures.</li> <li>• The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by placing development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond the current greenfield rates.</li> <li>• On site attenuation schemes would need to be tested against the Newnes Brook to ensure flows are not exacerbated downstream within the catchment.</li> <li>• 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. Assessment for runoff should include allowance for climate change effects.</li> <li>• Betterment on the existing site runoff rate should be sought to ensure that there is no increase in surface water flood risk elsewhere. Ideally, surface water runoff should be fully attenuated to the greenfield rate.</li> </ul>
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		<ul style="list-style-type: none"> <li>• Developers should refer to Shropshire Council's <a href="#">‘Surface Water Management: Interim Guidance for Developers’</a> and <a href="#">‘SuDS requirements for new developments’ webpage</a> and the Level 1 SFRA for information on SuDS.</li> <li>• New development must seek opportunities to reduce overall level of flood risk at the site, for example by: <ul style="list-style-type: none"> <li>○ Reducing volume and rate of runoff</li> <li>○ Relocating development to zones with lower flood risk</li> <li>○ Creating space for flooding.</li> </ul> </li> <li>• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space.</li> </ul>
<b>Key messages</b>		<p>The flood risk element of the Exception Test is likely to be passed if:</p> <ul style="list-style-type: none"> <li>• Development is limited to the 93% of the site located outside of the Environment Agency's Flood Zone 3, with development recommended in the north-east of the site, steered away from the areas at risk of fluvial flooding in the south-west of the site.</li> <li>• Areas in Flood Zone 2 are used for the least vulnerable parts of the development in accordance with Table 2 in the NPPF. No residential development is permitted in Flood Zone 3 and no development at all is permitted in Flood Zone 3b.</li> <li>• If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere (for example, if land is raised to permit development on one area, compensatory flood storage will be required in another).</li> <li>• Space for green infrastructure should be considered in the areas of highest flood risk.</li> </ul> <p>Refer to the detailed ‘guidance for developers’ section for further information on the measures that are appropriate for this site.</p>
<b>Mapping Information</b>		
The key dataset used to make planning recommendations regarding this site was the Environment Agency's Flood Map for Planning. More details regarding data used for this assessment can be found below.		
<b>Flood Zones</b>	Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning; this is based on 2D generalised modelling in this area as there is no detailed hydraulic model available. It is recommended that a more detailed hydraulic model is constructed at the site-specific Flood Risk Assessment stage, to confirm flood risk.	

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<b>Climate change</b>		Climate change was based on Flood Zone 2 to serve as an indication of possible extents. It is recommended that the latest EA's climate change allowances are modelled in a detailed hydraulic model as part of a site-specific Flood Risk Assessment.
<b>Fluvial depth, velocity and hazard mapping</b>		There is no available fluvial modelling data; therefore, the Risk of Flooding from Surface Water mapping has been used as this represents the floodplains of small watercourses. This should be explored further at site-specific stage.
<b>Surface Water</b>		The Risk of Flooding from Surface Water has been used to define areas at risk from surface water flooding.
<b>Surface water depth, velocity and hazard mapping</b>		The surface water depth, velocity and hazard mapping for the 1 in 30-year (high risk), 1 in 100-year (medium risk) and 1 in 1,000-year (low risk) events is taken from the Environment Agency's Risk of Flooding from Surface Water mapping.