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

<table>
<tr><td rowspan="5">Site details</td><td>Site Code</td><td colspan="4">SHF013</td></tr>
<tr><td>Address</td><td colspan="4">Land north of Meadow Drive, Shifnal</td></tr>
<tr><td>Area</td><td colspan="4">3.82 hectares</td></tr>
<tr><td>Current land use</td><td colspan="4">Greenfield</td></tr>
<tr><td>Proposed land use</td><td colspan="4">Residential</td></tr>
<tr><td rowspan="11">Sources of flood risk</td><td>Location of site within catchment</td><td colspan="4">The site lies in the upper-middle area of the Wesley Brook catchment, at the northern edge of Shifnal. The site is bounded by the embanked M54 to the north and this embankment extends into the western part of the site parallel to the B4379 (Newport Road). The site slopes gently downwards to the south with the area of lowest lying topography at the centre of the southern boundary.</td></tr>
<tr><td>Existing drainage features</td><td colspan="4">Mapping indicates the presence of a drainage channel passing through the centre of the site from north to south. The site lies approximately 450m upslope of the Wesley Brook as it flows through Shifnal.</td></tr>
<tr><td rowspan="6">Fluvial</td><td colspan="4">Proportion of site at risk</td></tr>
<tr><td>FZ3b</td><td>FZ3a</td><td>FZ2</td><td>FZ1</td></tr>
<tr><td>0%</td><td>0%</td><td>0%</td><td>100%</td></tr>
<tr><td colspan="4">Highest zone of risk (Risk of Flooding from Rivers and Sea)</td></tr>
<tr><td colspan="4">N/A</td></tr>
<tr><td colspan="4">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%)</td></tr>
<tr><td colspan="4">Available data:<br>The Environment Agency’s Flood Zone mapping has been used in this assessment. This is based on 2D generalised modelling data.<br>Flood characteristics:<br>The site is not impacted by Flood Zones 2 or 3 and does not fall within the Environment Agency’s Risk of Flooding from Rivers and Sea dataset.<br>Mapping indicates the presence of a drainage channel running through the site here; the site is being assessed at L2 due to surface water access constraints in this area, but the risk from this drainage channel should be investigated at site-specific level.</td></tr>
<tr><td rowspan="7">Surface Water</td><td colspan="4">Proportion of site at risk (RoFfSW)</td></tr>
<tr><td colspan="2">30-year</td><td>100-year</td><td>1,000-year</td></tr>
<tr><td colspan="2">9%</td><td>9%</td><td>12%</td></tr>
<tr><td colspan="4">Max depths (m)</td></tr>
<tr><td colspan="2">>0.9</td><td>>0.9</td><td>>0.9</td></tr>
<tr><td colspan="4">Max velocity (m/s)</td></tr>
<tr><td colspan="2">>0.25</td><td>>0.25</td><td>>0.25</td></tr>
<tr><td colspan="4">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 %)</td></tr>
</table>

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| **Site details** | **Site Code** | **SHF013** | | |
| | **Address** | Land north of Meadow Drive, Shifnal | | |
| | **Area** | 3.82 hectares | | |
| | **Current land use** | Greenfield | | |
| | **Proposed land use** | Residential | | |
| | | **Description of surface water flow paths:**<br>A surface water flow route runs through the centre of the site from north to south in all surface water events. Mapping indicates the presence of a drainage channel running through the site here. Where this flow route meets the southern boundary it potentially enters a culvert, though this in not indicated on OS mapping. At this point, there is an additional area of surface water ponding that extends westwards along the site boundary in the 1,000-year event.<br>The B4379 (Newport Road) passes through the site, behind a raised embankment at the western end of the site. This roadway acts as a major surface water flow route in all surface water events as the local topography steers and impounds the water along the roadway. In the 30-year event this ponding water is estimated to be >0.9m in depth. This presents considerable access constraints to the site. | | |
| | **Reservoir** | The site is not shown to be at risk of reservoir flooding from the available online maps. | | |
| | **Flood history** | There are no records of historic flooding at the site from the Environment Agency. | | |
| **Flood risk management infrastructure** | **Defences** | **Defence Type** | **Standard of Protection** | **Condition** |
| | | - | - | - |
| | | This site is not protected by any formal flood defences. | | |
| | **Residual risk** | There is a drainage channel running through the centre of the site from north to south which potentially flows into a culvert at the site's southern boundary. If this channel or culvert entrance were to become blocked, there is potential that surface water flooding would extend further onto the site away from the current confined surface water flow route. | | |
| | **Flood warning** | This site does not fall within the Environment Agency's Flood Warning or Flood Alert areas. | | |

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| | **Current land use** | Greenfield |
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| **Emergency planning** | **Access and egress** | The main route of access and egress to the site is from the B4379 at the western end of the site. However, this access route is inundated by surface water ponding in all surface water flooding events, estimated to be at a depth of >0.9m. This will likely leave the site inaccessible during all surface water flooding events.<br>A potential alternative route of access could be gained from Meadow Drive, along the site's southern boundary. Whilst there are areas of ponding along these roadways to the south of the site in all surface water events, they are estimated to reach a maximum depth of 0.3-0.9m in the 1,000-year event so it is possible that emergency service vehicles could continue to gain access to this site in flooding events.<br>Safe access and egress would be possible in all fluvial flood events as the site and the surrounding areas are not subject to fluvial flood risk.<br>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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<tr><td>Climate Change</td><td>Implications for the site</td><td colspan="2">• Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding.<br>• Flood Zone 2 can be used as an indication of increased fluvial flood risk as a result of climate change in the absence of more detailed modelling. However, this site is unaffected by fluvial flood risk and therefore fluvial flood risk from climate change does not increase.<br>• 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.<br>• The current day 1,000-year surface water flooding extent provides an indication of the likely increase in extent of the more frequent surface water events. The 1,000-year surface water flood event impacts 12% of this site, concentrated in the drainage channel through the centre of the site and along part of the southern boundary. A detailed FRA would be required to assess the site layout and design.<br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.</td></tr>
<tr><td rowspan="3">Cumulative Impact of development within the catchment</td><td rowspan="2">Level of risk</td><td>Catchment</td><td>Level of risk</td></tr>
<tr><td>Wesley Brook</td><td>High</td></tr>
<tr><td colspan="2">Development in the Wesley Brook catchment is mostly concentrated in the areas within or surrounding Shifnal with a number of proposed development sites covering a total of 0.41% of the catchment. The Wesley Brook has been identified as a catchment that is more sensitive to the cumulative impacts of any development within the catchment. Communities within this catchment are at risk of surface water flooding in the 100-year event.</td></tr>
<tr><td>Recommendations</td><td colspan="2">It is estimated that 549m$^3$ of long-term storage in addition to storage to capture the 100-year plus climate change event would need to be compensated for at this site to maintain current greenfield runoff rates. This could be achieved through contribution to existing and proposed flood alleviation schemes within Shifnal to promote long-term storage on site.<br>Refer to Section 9 of the main Level 2 SFRA for more information regarding the cumulative impact assessment and policy recommendations in this catchment.</td></tr>
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| **Requirements for drainage control and impact mitigation** | **Broad scale assessment of possible SuDS** | • Geology at the site consists of:<br>  ○ Bedrock: Bridgnorth Sandstone Formation – Sandstone. This underlies the majority of the site. The underlying geology reaches a boundary with Enville Member - Sandstone With Subordinate Conglomerate, Siltstone And Mudstone along the northern boundary of the site.<br>  ○ Superficial: The eastern part of the site is underlain by Till, Devensian – Diamicton. Glaciofluvial Deposits, Devensian are present in the southwest of the site, as it crosses the B4379.<br>• The site is located within the Environment Agency designated Source Protection Zone III – Total catchment. As such infiltration techniques should only be used where there are suitable levels of treatment although it is possible that infiltration may not be permitted. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints. 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 both to and from groundwater.<br>• 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. Additionally, proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints given that the site is located with a Source Protection Zone.<br>• There is an area of high groundwater flooding risk in the southwest corner of the site, infiltration methods should be avoided in this area.<br>• Detention features may be feasible provided site slopes are < 5% at the location of the detention feature. If the site has contamination or groundwater issues; a liner will be required.<br>• Filtration is probably suitable provided site slopes are <5% and the depth to the water table is >1m. If the site has contamination or groundwater issues; a liner will be required.<br>• 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. If the site has contamination or groundwater issues; a liner will be required.<br>• The site is not designated by the Environment Agency as previously being a landfill site.<br>• Developers should refer to Shropshire Council's 'Surface Water Management: Interim Guidance for Developers' and 'SuDS requirements for new developments' 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. |
| **NPPF and planning implications** | **Exception Test requirements** | 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 and steered away from surface water flow paths.<br>The Exception test will need to be applied if:<br>• More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2.<br>• Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b.<br>• More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b. |

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| | **Requirements and guidance for site-specific Flood Risk Assessment** | **Flood Risk Assessment:**<br>• 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.<br>• 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.<br>• 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 'Surface Water Management: Interim Guidance for Developers' and 'SuDS requirements for new developments' webpage.<br>• Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.<br>• 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.<br>• Development in FZ3b should be avoided unless appropriate use can be demonstrated in line with NPPF.<br>• Development in FZ3 may require floodplain compensation and this should be confirmed with the EA at FRA stage.<br>**Guidance for site design and making development safe:**<br>• 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).<br>• 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.<br>• 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.<br>• 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.<br>• On site attenuation schemes would need to be tested to ensure flows are not exacerbated downstream within the catchment.<br>• 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.<br>• 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.<br>• Developers should refer to Shropshire Council's 'Surface Water Management: Interim Guidance for Developers' and 'SuDS requirements for new developments' webpage, and the Level 1 SFRA for information on SuDS. |

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| | | • New development must seek opportunities to reduce overall level of flood risk at the site, for example by:<br>  ○ Reducing volume and rate of runoff<br>  ○ Relocating development to zones with lower flood risk<br>  ○ Creating space for flooding.<br>• 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. |
| **Key messages** | | The flood risk element of the Exception Test is likely to be passed if:<br>• Development is limited to the 88% of the site not impacted by the 1,000-year surface water flooding event. Development should be steered away from the surface water flow paths through the centre of the site or close to the B4379.<br>• If flood mitigation or SUDS 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).<br>• Space for green infrastructure should be considered in the areas of highest flood risk.<br>• Safe access and egress routes must not be in the areas of surface water risk. Consideration is therefore required for how access/ egress will be gained to the site, given the significant surface water risk on the main B4379 access road.<br>• This site lies within a catchment identified as high risk of cumulative impact of development. It is important to incorporate long-term storage capacity on this site to ensure current greenfield runoff rates are maintained. Refer to Section 9 in the main SFRA for specific policy recommendations related to this site and its wider catchment.<br>Refer to the detailed 'guidance for developers' section for further information on the measures that are appropriate for this site. |

## Mapping Information

The key datasets used to make planning recommendations regarding this site was the Environment Agency's Flood Map for Planning and the Risk of Flooding from Surface Water mapping. More details regarding data used for this assessment can be found below.

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| **Flood Zones** | Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning. |
| **Climate change** | Climate change was based on the 1,000-year surface water flooding event to serve as an indication of the potential increase in the extent of the 100-year surface water event as a result of climate change. 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. |

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| **Fluvial depth, velocity and hazard mapping** | | 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. |
| **Surface Water** | | The Risk of Flooding from Surface Water has been used to define areas at risk from surface water flooding. |
| **Surface water depth, velocity and hazard mapping** | | 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. |