# 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">CFD001, P28, P30 and P40</td></tr>
<tr><td>Address</td><td colspan="4">RAF Cosford</td></tr>
<tr><td>Area</td><td colspan="4">218 hectares</td></tr>
<tr><td>Current land use</td><td colspan="4">Mixed</td></tr>
<tr><td>Proposed land use</td><td colspan="4">Unknown (strategic site)</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 catchment of the River Worfe’s left bank in an area of higher elevation. Two unnamed tributaries join the River Worfe close to the southwest boundary of the site.</td></tr>
<tr><td>Existing drainage features</td><td colspan="4">The River Worfe joins with an unnamed tributary and runs from north to south close to the southwest boundary of the site, entrenched into low-lying topography. An unnamed watercourse runs east to west close to the southern boundary before joining the River Worfe at the south-west corner of the site, close to Watermans Lodge. This watercourse is also entrenched into the landscape at a lower elevation than the surrounding areas of the development site.</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 does not lie within Flood Zones 2 or 3 and is located on higher elevations compared to the nearby floodplains. Fluvial flood risk in this area is largely confined to the areas surrounding the watercourses which are entrenched at a lower topography.<br>There is minimal risk of flooding on this site according to the Environment Agency’s Risk of Flooding from Rivers and Sea mapping.<br>This site is being assessed at L2 as it is a large strategic site.</td></tr>
<tr><td rowspan="6">Surface Water</td><td colspan="4">Proportion of site at risk (RoFfSW)</td></tr>
<tr><td>30-year</td><td>100-year</td><td colspan="2">1,000-year</td></tr>
<tr><td>1%</td><td>2%</td><td colspan="2">8%</td></tr>
<tr><td colspan="4">Max depths (m)</td></tr>
<tr><td>0.3-0.9</td><td>0.3-0.9</td><td colspan="2">0.3-0.9</td></tr>
<tr><td colspan="4">Max velocity (m/s)</td></tr>
<tr><td>>0.25</td><td>>0.25</td><td colspan="2">>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** | **CFD001, P28, P30 and P40** | | |
| | **Address** | RAF Cosford | | |
| | **Area** | 218 hectares | | |
| | **Current land use** | Mixed | | |
| | **Proposed land use** | Unknown (strategic site) | | |
| | | **Description of surface water flow paths:**<br>A railway line runs east to west across the centre of the site. To the north of the railway line, accumulation of surface water flooding largely follows roadways, such as National Cycle route 81, or routes between buildings with evidence of areas that are susceptible to surface water ponding in all events. To the south of the railway line there are two broken surface water flow paths that largely follow small topographic depressions in the terrain, travelling from northeast to southwest in the 1,000-year event. Additional isolated areas of ponding are present across the site in all surface water events and particularly in the 1,000-year event. In general surface water risk is low.<br>If development is planned to be intensified on this site, a resulting increase in impermeable surfaces could increase surface water runoff and surface water flooding across 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 or Shropshire Council. | | |
| **Flood risk management infrastructure** | **Defences** | **Defence Type** | **Standard of Protection** | **Condition** |
| | | - | - | - |
| | | This site is not protected by any formal flood defences. | | |
| | **Residual risk** | Residual risk could occur where the unnamed watercourse enters a culvert in/ near the site, in case of any blockages. This risk would be very localised to that area of the site, given the topographic constraints. | | |
| **Emergency planning** | **Flood warning** | The site is not covered by the Environment Agency's Flood Warning Service. The unnamed watercourse close to the southern border of the site is covered by the River Worfe Flood Alert service (031WAF106). | | |

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| | **Access and egress** | Safe access and egress to the site is possible via the A41 during all fluvial flooding events. Most other smaller roads in the vicinity are also free of fluvial flood risk, though there are some localised locations where Flood Zones are shown to cross the road in the south-eastern corner, leading away from the A41. This may be because topography of the road is low, or that 2D generalised modelling does not account for channel and structure survey and hence in reality this may not flood the roads.<br>During all surface water events, access and egress to the north-east of the site is possible via the A41 from the north of the site. Ponding and flow routes occur on the A41 along the eastern boundary. According to the Environment Agency's Risk of Flooding from Surface Water maps, the estimated depths of flood waters in this location is 0.3-0.9m in the 30-year, 100-year and 1,000-year events. Flow paths and risk of flooding does not impede internal access to the southern part of the site.<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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| | **Address** | RAF Cosford | |
| | **Area** | 218 hectares | |
| | **Current land use** | Mixed | |
| | **Proposed land use** | Unknown (strategic site) | |
| **Climate Change** | **Implications for the site** | • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding.<br>• 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. The site is not subject to fluvial flood risk, suggesting that there will be minimal increase in fluvial flood risk on the site due to climate change given the topography.<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 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. On this site, 8% of the site is inundated with surface water during the 1,000-year flood event.<br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA. | |
| **Cumulative Impact of development within the catchment** | **Level of risk** | **Catchment** | **Level of risk** |
| | | Albrighton Brook/Neachley Brook | Low/Low |
| | | This large strategic site spans the Albrighton Brook and the Neachley Brook, lying close to the outlet of both catchments. Although both catchments have been identified as having low sensitivity to the cumulative impacts of development within the catchment, the proposed development covers 9% of the Albrighton Brook catchment and 4% of the Neachley Brook catchment and therefore it has been included within the cumulative impact assessment. | |
| | **Recommendations** | Development at this site is likely to result in the increased and intensification of impermeable surfaces across the site.<br>The provision of attenuation and long-term storage across the site is important to ensure that greenfield overland flow rates are maintained at current levels. There is potential opportunity to install storage areas across the site, particularly to the south of the railway line. If the site is to be developed in phases it will be necessary to ensure that drainage control features are designed to perform appropriately at all stages of development. Refer to Section 9 of the main Level 2 SFRA for more information on the cumulative impact assessment and policy recommendations at this site. | |

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| | **Area** | 218 hectares |
| | **Current land use** | Mixed |
| | **Proposed land use** | Unknown (strategic site) |
| **Requirements for drainage control and impact mitigation** | **Broad scale assessment of possible SuDS** | • Geology at the site consists of:<br>  ○ Bedrock: Helsby Sandstone Formation.<br>  ○ Superficial: Glaciofluvial Deposits – Sand and Gravel.<br>• The site is located with a Source Protection Zone. 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.<br>• Most source control techniques are likely to be suitable. Mapping suggests that slopes may be unsuitable for selective source control techniques.<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>• Detention systems are unlikely to be feasible as mapping suggests mean site slopes are > 5%. Feasibility of such options should be assessed as part of a site-specific assessment. If this feature is feasible a liner maybe required to prevent the egress of groundwater.<br>• Filtration systems are unlikely to be feasible as mapping suggests mean site slopes are > 5%. Feasibility of such options should be assessed as part of a site-specific assessment. If this feature is feasible it should be located where the depth to the water table is >1m, additionally a liner maybe required to prevent the egress of groundwater.<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. A liner maybe required to prevent the egress of groundwater.<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. |

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| **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.<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>• .<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 against the unnamed watercourses and the River Worfe 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 |

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| | | requirements for new developments' webpage, and the Level 1 SFRA for information on SuDS.<br>• 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 92% of the site that lies outside of the area at risk of flooding from surface water in the 1,000-year event. Development should be steered away if possible from the area to the north of the trainline and towards the northeast section of the site or areas to the south of the trainline away from observed surface water flow routes.<br>• 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).<br>• Space for green infrastructure should be considered in the areas of highest flood risk.<br>• See Section 9 of the main report for policy recommendations regarding the cumulative impacts of development at this site. Developers must provide capacity for long-term storage of surface water runoff to ensure the maintenance of current greenfield runoff rates.<br><br>Refer to the 'detailed guidance for developers' section (above) 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 Risk of Flooding from Surface Water mapping. More details regarding data used for this assessment can be found below.

| | |
|---|---|
| **Flood Zones** | 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. |
| **Climate change** | Climate change was based on the 1,000-year surface water 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. |

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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 Agency's Risk of Flooding from Surface Water mapping. |