

**Stratford on Avon District Council Level 2  
Strategic Flood Risk Assessment  
Detailed Site Summary Tables**



<b>Site details</b>	<b>Site Code</b>	<b>ALD.5[SCB.2]</b>			
	<b>Address</b>	Alderminster			
	<b>Area</b>	3.27 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 to the south east of Alderminster, near the centre of the Stour – confluence Back Brook to confluence River Avon catchment. The River Stour flows north west through the catchment and to the south west of the site, before joining the River Avon which flows westwards towards its confluence with the River Severn.			
	<b>Existing drainage features</b>	The River Stour passes within 200m of the southern and western corners of the site. There is an unnamed drain running southwards along the southwestern boundary of the site, which meets a drainage ditch that leads into a culvert under Shipston Road.			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>			
		<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
		0%	0%	0%	100%
		<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>			
		Very Low			
<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>					
<b>Available data:</b> The Environment Agency’s (EA) Flood Zone mapping has been used in this assessment. Where there is no detailed hydraulic model available, the Flood Zones are based on 2D generalised modelling.					
<b>Flood characteristics:</b> The site is not shown to currently be at risk of flooding from fluvial sources. Flood Zones associated with the River Stour are approximately 200m to the south west of the site. There is a small unnamed drain flowing along the southwestern boundary of the site. This was constructed in January 2020 to divert runoff away from The Old Stour housing development which is adjacent to the site. LiDAR data shows the topography slopes away from the site here so it is likely the drain will not cause significant flood risk to the site, but this should be confirmed at the site-specific Flood Risk Assessment (FRA) stage.					

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	<b>Current land use</b>	Greenfield		
	<b>Proposed land use</b>	Residential		
	<b>Surface Water</b>	<b>Proportion of site at risk (RoFfSW)</b>		
		<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>
		0%	0%	2%
		Max depths (m)		
		N/A	N/A	<0.3
		Max velocity (m/s)		
		N/A	N/A	>0.25
		<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>		
		<b>Description of surface water flow paths:</b>		
		Risk of Flooding from Surface Water data for this site shows a minor flow path in the 1,000-year event. This flows across the lower half of the site from the north east side to the south west side, with flood depths below 0.3m and velocities greater than 0.25m/s. Information (such as videos, photos and emails) provided by local stakeholders and the Parish Council indicates there have been ongoing surface water run-off and flooding issues affecting The Old Stour development to the south west of the site. This led to the construction of a significant land drain in January 2020 to channel surface runoff to the south of the development and into a culvert under the A3400. This land drain routes via Tithe Bungalow's paddock, which has flooded on several occasions in 2019. This level of recent detail is not included in the national scale mapping.		
<b>Reservoir</b>	The site is not shown to be at risk of reservoir flooding from the available <a href="#">online</a> maps.			

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	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
	<b>Groundwater</b>	<p>The EA's Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comment can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> <li>The entire site is shown to have less than a 25% susceptibility to groundwater flood emergence.</li> </ul> <p>JBA's Groundwater Mapping dataset shows that the entire site has been designated as no risk.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.</p>
	<b>Flood history</b>	<p>The site is not shown to be within the reaches of the EA's Historic Flood Map. Approximately 200m south west of the site, the River Stour and its floodplain is included.</p> <p>Alderminster Parish Council hold records of surface water flooding near the site, which is associated with The Old Stour housing development just to the south west. In November 2019, heavy rain led to surface water flowing off the ALD.05 site onto The Old Stour development, causing flooding to garages and nearly flooding properties. In December 2019, installation of a new drain began but before it was completed, further surface water flooding occurred due to damaged culverts and pipework as well as the removal of a temporary dam associated with The Old Stour development. This caused flooding of the land and sheds of Tithe Bungalow which is to the south of the development. The drain construction was finished in January 2020, running along the southwestern boundary of the ALD.05 site into a ditch which flows into the culvert under the A3400 road. In February 2020, the culvert under the A3400 became blocked leading to surface water flooding. This affected sheds, the garden and the paddock of Tithe Bungalow, as well as parts of the A3400.</p>
	<b>Defences</b>	The site is not protected by any formal flood defences.

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	<b>Proposed land use</b>	Residential
<b>Flood risk management infrastructure</b>	<b>Residual risk</b>	<p>To the south west of the site, a drain leads to a culvert under the A3400. If these structures became blocked, flooding could extend upstream and onto the development site. It is reported that the culvert under the A3400 has been blocked/ damaged in the past and hence was overwhelmed with the volume of water. Pumping equipment has been previously used to reduce the risk of flooding onto the A3400.</p> <p>A site-specific FRA should investigate the impacts of blockage to this culvert on the climate change scenario and confirm risk to the site as well as help inform finished floor levels in-site.</p>
<b>Emergency planning</b>	<b>Flood warning</b>	The site is not within any EA Flood Warning or Alert areas.
	<b>Access and egress</b>	<p>Access and egress at the south end of the site can occur off Shipston Road (A3400) along a track to the south of The Old Stour development. This is unlikely to be affected by fluvial flooding which is confined to the floodplain surrounding the River Stour, approximately 200m southwest from the site.</p> <p>In terms of surface water flooding, access and egress may be impeded as there is a risk of flooding on Shipston Road during the 30-year event, to depths between 0.3m and 0.9m and velocities above 0.25m/s. These depths and velocities are also reached in the 100-year and 1,000-year events, and the extent of the road covered increases. Furthermore, a drainage ditch which has flooded in the past runs alongside the access track to the site, so may pose an additional risk to access and egress.</p>

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	<b>Proposed land use</b>	Residential
<b>Climate Change</b>	<b>Implications for the site</b>	<ul style="list-style-type: none"> <li>• Whilst the site is not currently shown to be at risk of flooding, the site's close proximity to the unmodelled drain poses potential risk. LiDAR data at the site shows the topography slopes down away from the site, which may indicate that increased flooding resulting from climate change would have a minimal impact on the southwestern side of the site.</li> <li>• It is recommended that developers undertake further investigations or modelling of the drain at the site-specific FRA stage to determine whether the site may be at risk of flooding in the future. If a detailed model is constructed, this should test the 2080s climate change allowances in a hydraulic model, to ascertain the impact at the site.</li> <li>• At a detailed assessment stage, the impacts of climate change on the functional floodplain may need to be considered. This is likely to resemble the increase in extent from Flood Zone 3b (20-year extent) to Flood Zone 3a (100-year extent), for the purposes of a strategic assessment. As the topography slopes up to the site from the River Stour, this is likely to have minimal impact on the site.</li> <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>• Climate change should also 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 flooding extent provides an indication of the likely increase in extent of the more frequent surface water 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>

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	<b>Proposed land use</b>	Residential
<b>Requirements for drainage control and impact mitigation</b>	<b>Broad scale assessment of possible SuDS</b>	<p>Geology at the site consists of:</p> <ul style="list-style-type: none"> <li>• Bedrock – Penarth Group- mudstone.</li> <li>• Superficial – None recorded</li> </ul> <ul style="list-style-type: none"> <li>• All forms of source control are likely to be suitable. The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</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>• The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.</li> </ul>

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	<b>Proposed land use</b>	Residential
<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 must be passed before the Exception Test is applied. Residential development is classified as 'More Vulnerable'.</p> <p>It is recommended that proposed development will be sequentially located within Flood Zone 1 areas of the site, which may need to be confirmed through a site-specific assessment of the unnamed drain along the southwestern boundary.</p> <p>If detailed modelling of the unnamed drain shows the site to be in Flood Zone 3, the Exception test will need to be applied if More Vulnerable and Essential Infrastructure development is located in FZ3a and for Highly Vulnerable development located in FZ2.</p> <p>Given the recent flooding which has occurred in this local area, this should be considered in terms of allocating and masterplanning the site, to ensure that the development can be made safe for its lifetime and does not exacerbate this risk further on third party land.</p> <p>Development will not be permitted for the following scenarios:</p> <ul style="list-style-type: none"> <li>• Highly Vulnerable Infrastructure within FZ3a and FZ3b.</li> <li>• More Vulnerable and Less Vulnerable Infrastructure within FZ3b.</li> </ul>

**Requirements and guidance for site-specific Flood Risk Assessment**

**Flood Risk Assessment:**

- At the planning application stage, a site-specific Flood Risk Assessment will be required for this site as the development is in close proximity to a drainage channel, may be subject to other sources of flooding and may introduce a more vulnerable use. It will also be required where development sites:
  - are 1 hectare or more in size;
  - contain land which has been identified by the EA as having critical drainage problems; or
  - contain land identified in the strategic flood risk assessment as being at increased flood risk in future.
- A detailed hydraulic model may be required at FRA stage, to confirm flood risk and climate change extents from the drain along the southwestern boundary of the site.
- Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.
- Local stakeholders and the Parish Council also hold a lot of local information, photos and videos on recent flooding that has occurred in this area and knowledge of the drainage system, which are not represented in national mapping or current detailed studies. It is recommended that any detailed site-specific FRA obtains and accounts for this information to ensure risk is correctly assessed.
- All sources of flooding, particularly the risk of fluvial, surface water and groundwater flooding, should be considered as part of a site-specific FRA.
- Flood risk needs to be considered for the lifetime of the development, accounting for climate change.
- The development should be designed using a sequential approach. Development should be steered away from areas of potential fluvial and surface water flood risk along the southwestern boundary drain and the surface water flow path bisecting the southern part of the site in the 1,000-year event, preserving these spaces as green infrastructure.
- Development must be in line with Table 3: flood risk vulnerability and Flood Zone compatibility of the NPPG.
- Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Stratford on Avon District Council's Local Plan policies, the LLFA's (Warwickshire County Council) '[Surface Water Management Plan](#)' and '[Stratford on Avon District Core Strategy 2011 to 2031](#)'.
- If a detailed model shows the southwestern boundary to be in Flood Zone 3, development in FZ3b should be avoided unless appropriate use can be demonstrated in line with NPPF.
- Blockage residual risk will need to be investigated and modelled in a FRA to confirm impacts and help inform finished flood levels.

**Guidance for site design and making development safe:**

- 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

		<p>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).</p> <ul style="list-style-type: none"> <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 watercourse to ensure flows are not exacerbated downstream within the catchment.</li> <li>• All 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>• Developers should refer to Warwickshire County Council’s <a href="#">‘Surface Water Management Plan’</a>, Stratford on Avon District’s <a href="#">‘Core Strategy 2011 to 2031’</a> and the <a href="#">Level 1 SFRA</a> for information on SuDS.</li> <li>• SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.</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>
<p><b>Key messages</b></p>		<p>The site is likely to be suitable for development subject to:</p> <ul style="list-style-type: none"> <li>• Development is avoided near the south western boundary where the unnamed drain poses a potential fluvial and surface water flood risk. A detailed hydraulic model may be needed at site-specific stage to confirm the flood risk to the site and the impacts of climate change from the unmodelled watercourse.</li> <li>• Safe access and egress need to be considered as the main access point is affected by surface water flooding</li> </ul>

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	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
		<p>on the A3400 road and in the drainage ditch by the access track.</p> <ul style="list-style-type: none"> <li>• If flood mitigation measures are implemented, then they are tested to ensure that they will not displace water elsewhere, and these take into account the flooding that has occurred recently, and local conditions not represented in national mapping.</li> <li>• Space for green infrastructure should be considered in the areas of highest flood risk.</li> <li>• A site-specific FRA demonstrates that the site is not at an increased risk of flooding in the future as a result of climate change or blockage risk from the culvert under the A3400, and that the development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties, taking into account the local data from recent flood events.</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>		
<p>The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning and the Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.</p>		
<b>Flood Zones</b>	<p>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 to the unmodelled drain. The site is not at risk from the River Stour.</p>	
<b>Climate change</b>	<p>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 for the unmodelled drain as part of a site-specific FRA.</p>	

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	<b>Proposed land use</b>	Residential
<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 100-year event (considered to be medium risk) is taken Environment Agency's Risk of Flooding from Surface Water.

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<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>			
	<b>Address</b>	Long Itchington			
	<b>Area</b>	1.10 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>	This site is located in the north western corner of the Stratford-on-Avon district. The site lies in the mid to lower catchment of the small River Itchen. This site is also located in the middle of the River Avon catchment, as it does not reach its confluence with the Severn for some distance beyond the district. The eastern boundary lies on Collingham Lane, just off of the A432.			
	<b>Existing drainage features</b>	The Environment Agency's Detailed River Network shows no ordinary watercourses, canals or smaller drains within the site. The Grand Union Canal flows westward 600m south of the site. To both the north and south of the site, a tributary of the River Itchen flows westwards to their confluence point.			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>			
		<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
		0%	0%	0%	100%
		<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>			
		N/A			
		<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>			
	<b>Available data:</b>	The Environment Agency's (EA) Flood Zone mapping has been used in this assessment.			
	<b>Flood characteristics:</b>	There are no Flood Zones present at the site. In some OS Mapping there is no small drain shown, but on the EA's Flood Map for Planning online, there is a blue line representing a small field drain evident. This is in the same alignment of the surface water flow path shown through the centre of the site. A more detailed assessment should be conducted to determine whether there is a drain present at this site, and if so, what flood risk this may pose. It is likely that it would be similar to the surface water extents.			
<b>Surface Water</b>	<b>Proportion of site at risk (RoFfSW)</b>				
	<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>		
	7%	10%	21%		

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	<b>Current land use</b>	Greenfield		
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	Max depths (m)			
	0.3-0.6m	0.3-0.6m	0.3-0.6m	
	Max velocity (m/s)			
	Over 2.5m/s	Over 2.5m/s	Over 2.5m/s	
	<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>  This site has been flagged for concerns over surface water flooding and drainage. Surface water flows impact the site in all events.  In the 30-year event there is a flow route through the centre of the site from north-east to south-west, bisecting the site. This flow path is largely below 0.3m in depth; however, some areas of the main flow path are up to 0.6m deep.  The 100-year extents are similar to the 30-year, in addition to the localised ponding spreading to create a secondary flow route. These extents are largely between 0.3-0.6m deep.  In the 1,000-year event, the extents cover most of the centre of the site, with two further extensions south-eastward from the main flow path towards Collingham Lane. The majority of these depths are between 0.3m and 0.6m. Flows in all events have velocities mostly over 2.5m/s.  There is a small area of ponding along the lower half of the south-eastern border, on Collingham Lane in the 1,000-year event.</p>			
<b>Reservoir</b>	The site is not shown to be at risk of reservoir flooding from the available <a href="#">online</a> maps; however, the maximum extent from reservoir flooding does reach within 10m of the site.			

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	<b>Proposed land use</b>	Residential								
	<b>Groundwater</b>	<p>The EA's Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> <li>The entire site is shown to have between 25% and 50% susceptibility to groundwater flood emergence</li> </ul> <p>JBA's Groundwater Mapping dataset shows that the whole site has no risk, suggesting groundwater is more than 5m below the surface. This suggests groundwater is unlikely to emerge at the surface locally.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.</p>								
	<b>Flood history</b>	This site is within the reaches of the Environment Agency's Historic Flood Map and has two incidents of recorded flood history.								
<b>Flood risk management infrastructure</b>	<b>Defences</b>	<table border="1"> <thead> <tr> <th><b>Defence Type</b></th> <th><b>Standard of Protection</b></th> <th><b>Condition</b></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	<b>Defence Type</b>	<b>Standard of Protection</b>	<b>Condition</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>	There are no obvious residual risks present at the site. A site-specific risk assessment is recommended to investigate potential risks further and determine whether there is a drain and indeed culvert under the properties bounding Southam Road. If there is, the risk of blockage may need to be investigated at site-specific stage.								
<b>Emergency planning</b>	<b>Flood warning</b>	The site is not covered by the Environment Agency's Flood Warning Service.								
	<b>Access and egress</b>	Access and egress at this site are possible via Collingham Lane which bounds the south-eastern boundary. Access can be gained at any point along this road. There is some surface water flooding in the 1,000-year event (low risk) therefore, it is recommended that a site-specific Flood Risk Assessment is undertaken to confirm access for vehicles and pedestrians.								

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>
	<b>Address</b>	Long Itchington
	<b>Area</b>	1.10 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<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>• It is recommended that developers undertake further assessment at the site-specific FRA stage to determine whether the site may be at risk of flooding from a small field drain shown on some OS mapping. If a drain is present, a detailed model may be required to test fluvial risk and determine impacts from climate change in the future.</li> <li>• Climate change should also be considered for surface water events; at the site-specific stage, the 100-year +40% should be considered as part of surface water drainage strategies, or surface water modelling.</li> <li>• 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. This shows the central portion of the site to be at risk, bisecting the eastern and western halves. 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>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>
	<b>Address</b>	Long Itchington
	<b>Area</b>	1.10 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<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 – Penarth Group - Argillaceous Rock And [subequal/subordinate] Limestone, Interbedded.</li> <li>○ Superficial – None recorded</li> </ul> </li> <li>• All forms of source control are likely to be suitable. The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</li> <li>• 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 &lt;1m.</li> <li>• Mapping suggests that the site slopes are suitable for all forms of detention. A liner maybe required to prevent the egress of groundwater.</li> <li>• All filtration techniques are likely to be suitable. A liner maybe required to prevent the egress of groundwater.</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. A liner maybe required to prevent the egress of groundwater.</li> <li>• The site is not designated by the Environment Agency as previously being a landfill site.</li> <li>• The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.</li> </ul>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>
	<b>Address</b>	Long Itchington
	<b>Area</b>	1.10 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<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 and therefore this should pass the Exception Test. Should a detailed assessment find there is fluvial risk from a field drain, similar to that in the surface water extents, then development should be steered away from the central flow route.</p>

	<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. This site falls under these requirements.</li> <li>• Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.</li> <li>• All sources of flooding, particularly the risk of fluvial, surface water and groundwater flooding, should be considered as part of a site-specific Flood Risk Assessment.</li> <li>• Flood risk needs to be considered for the lifetime of the development, accounting for climate change.</li> <li>• A more detailed assessment should be conducted to determine whether there is a drain present at this site, and if so, what flood risk this may pose.</li> <li>• Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Stratford on Avon District Council's Local Plan policies, the LLFA's (Warwickshire County Council) '<a href="#">Surface Water Management Plan</a>' and '<a href="#">Stratford on Avon District Core Strategy 2011 to 2031</a>'.</li> <li>• The development should be designed using a sequential approach. Development must be in line with Table 3: flood risk vulnerability and flood zone compatibility of the NPPG.</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 on Collingham Lane.</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 watercourse 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.</li> </ul>
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## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>
	<b>Address</b>	Long Itchington
	<b>Area</b>	1.10 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
		<p>Assessment for runoff should include allowance for climate change effects.</p> <ul style="list-style-type: none"> <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> <li>• Developers should refer to Warwickshire County Council's '<a href="#">Surface Water Management Plan</a>', Stratford on Avon District's '<a href="#">Core Strategy 2011 to 2031</a>' and the <a href="#">Level 1 SFRA</a> for information on SuDS.</li> <li>• All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.</li> <li>• SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.</li> <li>• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.</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>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>
	<b>Address</b>	Long Itchington
	<b>Area</b>	1.10 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<b>Key messages</b>	<p>The site is likely to be suitable for development subject to:</p> <ul style="list-style-type: none"> <li>• Development is steered away from the central surface water flow route (which may also be the same alignment as a small field drain).</li> <li>• A more detailed assessment is conducted to determine whether there is a drain present at this site, and if so, what flood risk this may pose.</li> <li>• Access from the northern half of the site should be considered given the flow route bisects the site.</li> <li>• If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere.</li> <li>• Space for green infrastructure should be considered in the areas of highest flood risk.</li> <li>• A site-specific FRA demonstrates that the site is not at an increased risk of flooding in the future as a result of climate change, and that the development of the site does not increase the risk of flooding on the site and to neighbouring properties.</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>		
<p>The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning and the Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.</p>		
<b>Flood Zones</b>	<p>Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning; there are no Flood Zones present at the site.</p>	
<b>Climate change</b>	<p>Climate change mapping was unavailable for this area. The 1,000-year surface water flooding event was used as an indicative climate change scenario. It is recommended that the latest EA's climate change allowances are modelled in a detailed hydraulic model as part of a site-specific FRA.</p>	

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>LONG.4 [SCB.5]</b>
	<b>Address</b>	Long Itchington
	<b>Area</b>	1.10 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<b>Fluvial depth, velocity and hazard mapping</b>		There is no data available 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 100-year event (considered to be medium risk) is taken Environment Agency's Risk of Flooding from Surface Water.

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>			
	<b>Address</b>	Stratford College			
	<b>Area</b>	0.58 hectares			
	<b>Current land use</b>	Mixed use			
	<b>Proposed land use</b>	Extension to school			
<b>Sources of flood risk</b>	<b>Location of site within catchment</b>	<p>The site is located on the western side of Stratford-upon-Avon. It lies on the banks of the Racecourse Brook which flows from north to south through the town before joining in confluence with the River Avon downstream of Stratford-upon-Avon. The development site is situated approximately 420m to the south of the Stratford-upon-Avon canal which passes from northwest to southeast through the town centre to its outfall into the River Avon.</p> <p>Site topography is relatively flat with the slightly elevated Alcester Road bounding the site along its northern border.</p>			
	<b>Existing drainage features</b>	<p>The Racecourse Brook runs from north to south along the western boundary of the site. This section of the watercourse is culverted, entering the culvert directly upstream of the site north of Alcester Road and emerging into open channel 75m to the south of the development site.</p>			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>			
		<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
		0%	0%	40%	60%
<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>					
N/A					
<p><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></p>					

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>		
	<b>Address</b>	Stratford College		
	<b>Area</b>	0.58 hectares		
	<b>Current land use</b>	Mixed use		
	<b>Proposed land use</b>	Extension to school		
		<p><b>Available data:</b> The Environment Agency's Flood Zone mapping has been used in this assessment alongside the latest Racecourse Brook hydraulic modelling results received for this SFRA. Modelled flood extents are extracted from the April 2019 Environment Agency Racecourse Brook Model.</p> <p><b>Flood characteristics:</b> The modelled Flood Zone data shows that Flood Zone 2 (1,000-year event) inundates large portions of the southern and western area of the site, steered by the lowest lying topography across the site. Flood Zone 2 encroaches onto the site from the northwest, with water shown to spill over Alcester Road and onto the lower-lying topography south of the elevated roadway. The site is not impacted by Flood Zone 3a (100-year event) or Flood Zone 3b (20-year event).</p>		
	<b>Surface Water</b>	<b>Proportion of site at risk (RoFfSW)</b>		
		<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>
		0%	0%	2%
		Max depths (m)		
		N/A	N/A	<0.3
		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> Mapping indicates that there is minimal surface water flood risk at the site. Only a small area in the southwest of the site is affected in the 1,000-year event and depths of floodwaters are estimated to remain below 0.3m.</p>			
	<b>Reservoir</b>	This site is not shown to be at risk of flooding from reservoirs.		

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>		
	<b>Address</b>	Stratford College		
	<b>Area</b>	0.58 hectares		
	<b>Current land use</b>	Mixed use		
	<b>Proposed land use</b>	Extension to school		
	<b>Groundwater</b>	<p>The EA's Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> <li>• The majority of the site is shown to have &lt;25% susceptibility to groundwater flood emergence.</li> <li>• The very southern end of the site is shown to have &gt;75% susceptibility to groundwater flood emergence.</li> </ul> <p>JBA's Groundwater Mapping dataset shows that the northwest corner of the site is at no risk of groundwater flooding. The mapping indicates that the majority of the south and east of the site has groundwater levels between 0.025m and 0.5m below the ground surface, suggesting groundwater may emerge at the surface locally.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.</p>		
	<b>Flood history</b>	<p>The Environment Agency Historic Flood mapping does not indicate any incidences of historic flooding across this site. There are a number of incidents of historic flooding incidents across Stratford-upon-Avon associated with the Shottery Brook to the west of the site and the River Avon to the east.</p>		
<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.		

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>
	<b>Address</b>	Stratford College
	<b>Area</b>	0.58 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Extension to school
	<b>Residual risk</b>	<p>The Racecourse Brook enters a culvert to pass beneath a slightly embanked Alcester Road directly upstream of the site's northern boundary. Fluvial modelling results indicate that this roadway acts to impound water which spills over and extends into areas of lower-lying topography to the south where the development site is located. If this culvert were to become blocked there is potential that additional water would back up behind Alcester Road, causing larger amounts of water to spill south over the road and increase flooding on the development site.</p> <p>A site-specific FRA should investigate the impacts of blockage of this hydraulic structure to confirm risk to the site as well as to help inform finished floor levels, particularly in climate change scenarios.</p>
<b>Emergency planning</b>	<b>Flood warning</b>	The site does not fall within the Environment Agency's Flood Warning or Flood Alert Areas.
	<b>Access and egress</b>	<p>Access and egress to the site can be gained from Willows Drive North on the eastern boundary of the site or from Alcester Road along the northern boundary.</p> <p>Access to the site is possible in all surface water events. There is indication of some surface water ponding on Willows Drive North in the 1,000-year event, but the depth is estimated to remain below 0.3m and therefore is unlikely to hinder access for emergency services.</p> <p>In the 1,000-year fluvial flooding event (represented by modelled Flood Zone 2 events), Alcester Road along the northern site boundary is inundated which could hinder access to the site for emergency services. Flood Zone 3a and 3b extend across Alcester Road to the west of the site, associated with flooding from the Shottery Brook which could affect how emergency services travel towards the site if this watercourse is also flooded.</p> <p>A site-specific Flood Risk Assessment should be undertaken to evaluate accessibility to pedestrians and vehicles at both of these access points, particularly in the 1,000-year fluvial flood risk event.</p>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>
	<b>Address</b>	Stratford College
	<b>Area</b>	0.58 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Extension to school
<b>Climate Change</b>	<b>Implications for the site</b>	<ul style="list-style-type: none"> <li>Hydraulic modelling results indicate the extent of climate change modelling for the 2080s Central (100-year plus 25%) and Upper End (100-year plus 70%) climate change scenarios. The Central scenario shows no additional flood risk at the development site. In the Upper End (100-year plus 70%) climate change scenario, fluvial flood extents are generally similar to current 1,000-year flood extents but cover a larger extent of the southern and western area of the site.</li> <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>Climate change should also 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 flooding extent provides an indication of the likely increase in extent of the more frequent surface water events. The 1000-year surface water flooding extent covers 2% of this site so it is unlikely that climate change will have a great impact on surface water flooding on the site. However, a detailed FRA would be required to assess the site layout and design.</li> <li>Developers should consider SuDS strategies to reduce the potential impacts of climate change from surface water in a detailed site-specific FRA.</li> </ul>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>
	<b>Address</b>	Stratford College
	<b>Area</b>	0.58 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Extension to school
<b>Requirements for drainage control and impact mitigation</b>	<b>Broad scale assessment of possible SuDS</b>	<p>Geology at the site consists of:</p> <ul style="list-style-type: none"> <li>• Bedrock – Mercia Mudstone Group - Mudstone.</li> <li>• Superficial – Wasperton Sand and Gravel Member - Sand and Gravel.</li> </ul> <ul style="list-style-type: none"> <li>• All forms of source control are likely to be suitable. The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</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>• 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</li> </ul>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>
	<b>Address</b>	Stratford College
	<b>Area</b>	0.58 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Extension to school
<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.</p> <p>Residential development is classified as 'More Vulnerable' and Employment development is classified as 'Less Vulnerable'. For mixed use developments, the highest level of vulnerability should be considered. 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 as the Racecourse Brook is culverted alongside the western boundary of the development site. Modelling results indicate that the site is subject to fluvial flooding from water spilling southwards across Alcester Road at the northern boundary. The development may introduce a more vulnerable use. It will also be required where development sites: <ul style="list-style-type: none"> <li>○ Are 1 hectare or more in size;</li> <li>○ Contain land which has been identified by the EA as having critical drainage problems; or</li> <li>○ Contain land identified in the strategic flood risk assessment as being at increased flood risk in the future.</li> </ul> </li> <li>• Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.</li> <li>• Blockage residual risk will need to be investigated and modelled in a detailed FRA to confirm impacts and help inform finished floor levels.</li> <li>• All sources of flooding, particularly the risk of fluvial, surface water and groundwater flooding, should be considered as part of a site-specific FRA.</li> <li>• Flood risk needs to be considered for the lifetime of the development, accounting for climate change.</li> <li>• Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; Worcestershire County Council’s Local Plan policies, and the LLFA’s <a href="#">‘Surface Water Management Plan’</a> and <a href="#">‘SuDS design and evaluation guide’</a> webpage.</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, particularly in the south and west of the site.</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. Climate change modelling indicates that flood risk could increase across the site so development should be steered away from these areas. 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> </ul>
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## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



Site details	Site Code	Stratford College [SUA.8]
	Address	Stratford College
	Area	0.58 hectares
	Current land use	Mixed use
	Proposed land use	Extension to school
		<ul style="list-style-type: none"> <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 and no increase in downstream discharge from the site.</li> <li>On site attenuation schemes would need to be tested against the watercourses 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>Developers should refer to Warwickshire County Council's '<a href="#">Surface Water Management Plan</a>', Stratford on Avon District's '<a href="#">Core Strategy 2011 to 2031</a>' and the <a href="#">Level 1 SFRA</a> for information on SuDS.</li> <li>All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.</li> <li>SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.</li> <li>Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.</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> </ul>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Stratford College [SUA.8]</b>
	<b>Address</b>	Stratford College
	<b>Area</b>	0.58 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Extension to school
<b>Key messages</b>	<p>The site is likely to be suitable for development subject to:</p> <ul style="list-style-type: none"> <li>• Development is preferentially located in areas at lower risk of fluvial flood risk. The northeast area of the site is less susceptible to fluvial flood risk.</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) and will not be detrimental to flood risk downstream of the site.</li> <li>• Space for green infrastructures or storage of flood waters 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>		
<p>The key datasets used to make planning recommendations regarding this site were the Environment Agency's Risk of Flooding from Surface Water map and the most recent Environment Agency hydraulic modelling results for the Racecourse Brook (April 2019). More details regarding data used for this assessment can be found below.</p>		
<b>Flood Zones</b>	Flood Zones 2 and 3 originate from the latest Racecourse Brook 1D-2D hydraulic model obtained as part of this Level 2 SFRA.	
<b>Climate change</b>	Climate change was based on the latest Racecourse Brook 1D-2D hydraulic model, obtained as part of this Level 2 SFRA, where the 100-year fluvial flood event was upscaled by 25%, 35% and 70% to reflect the 2080s epoch.	
<b>Fluvial depth, velocity and hazard mapping</b>	Fluvial depth, velocity and hazard mapping was not provided for the most recent Racecourse Brook model; 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 map 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 100-year event (considered to be medium risk) is taken Environment Agency's Risk of Flooding from Surface Water.	



# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
<b>Sources of flood risk</b>	<b>Location of site within catchment</b>	<p>This large site is located to the northwest of Wellesbourne, close to the confluence of the River Avon and the River Dene. The site is split across two sub-sections with one large area located to the north of the River Dene and a small section located on the south bank of the River Dene, along Stratford Road. For the purposes of this assessment the large section of the site will be referred to as Section A and the smaller section to the south will be referred to as Section B.</p> <p>The area of Section A encompasses three unnamed ordinary watercourses that flow into the River Avon downstream of the site.</p> <p>Topography is varied with higher elevations at the north and south of Section A bisected by a low-lying corridor running east to west through the centre of the site following the path of an unnamed ordinary watercourse.</p> <p>Section B lies on the southern bank of the River Dene which flows from east to west close to its northern boundary. The site lies on topography which slopes from higher ground in the south to lower topography in the north.</p>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>		
	<b>Address</b>	Wellesbourne Campus		
	<b>Area</b>	133.43 hectares		
	<b>Current land use</b>	Mixed use		
	<b>Proposed land use</b>	Innovation Campus for research and development		
<b>Existing drainage features</b>	<p>An unnamed ordinary watercourse flows from east to west along the northern boundary of Section A. This watercourse diverges from the Thelsford Brook approximately 2.3km upstream of the site, to the east. Approximately 600m to the west of the site, this watercourse re-joins the Thelsford Brook which soon after flows into the River Avon. Two ordinary watercourses, which flow onto the site from the east, join in confluence close to the eastern boundary. The combined watercourse then flows east to west through the centre of the site, steered by the low-lying topography. Downstream of Section A, the watercourse turns to the southwest before joining in confluence with the River Avon approximately 1km downstream of the site. There is existing development on the site, with hydraulic structures such as bridges or culverts likely to be present at locations where the watercourse crosses access routes or roadways through the site.</p> <p>Section B lies on the southern bank of the River Dene which flows from east to west close to its northern boundary and joins in confluence with the River Avon approximately 1km to the northwest of the site.</p> <p>Information provided by a local stakeholder indicates that the unnamed watercourse passing through the centre of Section A has been extensively modified from its natural course, both historically and in more recent years. Alterations such as channel widening have also been carried out in order to alleviate flooding.</p>			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>		
<b>FZ3b</b>		<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
7%		7%	11%	89%
<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>				
High				
<p><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></p>				

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>		
	<b>Address</b>	Wellesbourne Campus		
	<b>Area</b>	133.43 hectares		
	<b>Current land use</b>	Mixed use		
	<b>Proposed land use</b>	Innovation Campus for research and development		
		<p><b>Available data:</b>                      The Environment Agency's Flood Zone mapping has been used in this assessment. This dataset represents flood risk associated with the ordinary watercourse running through the centre of the site.                      The catchment of the watercourse which runs along the northern boundary is &lt;3km<sup>2</sup>, and hence is not represented in the EA's Flood Zones.</p>		
		<p><b>Flood characteristics:</b>                      Flood Zones indicate that the majority of the Section A is not at risk from fluvial flooding. Flood Zone 2, 3a and 3b are present on the site, primarily focused within the low-lying topographic corridor surrounding the ordinary watercourse through the centre of the site. Flood Zone 2 extends slightly further away from the channel than Flood Zones 3a and 3b. The ordinary watercourse running along the northern boundary of Section A is not shown to provide any additional fluvial flood risk on the site. This is because it has a catchment area &lt;3km<sup>2</sup>, and hence is not represented in the EA's Flood Zones. However, this does not mean there is no risk posed; the watercourse also appears to lie in a localised corridor of lower topography, similar to the ordinary watercourse in the centre of the site. This infers that there is potential for the watercourse along the northern boundary to pose some fluvial flood risk to the site, due to the similar topographic characteristics.                      Section B is shown to be at minimal risk of fluvial flooding. Flood Zones 2 and 3 encroach slightly across the northern boundary in the area of lowest-lying topography.</p>		
	<b>Surface Water</b>	<b>Proportion of site at risk (RoFfSW)</b>		
		<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>
		1%	2%	11%
		Max depths (m)		
		>0.9	>0.9	>0.9
Max velocity (m/s)				
>0.25	>0.25	>0.25		

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
		<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>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
		<p><b>Description of surface water flow paths:</b></p> <p>The Environment Agency Risk of Flooding from Surface Water mapping dataset indicates that surface water flood risk on the site is primarily driven by site topography and in general converges towards watercourses passing through the site.</p> <p>Surface water flow routes surrounding the ordinary watercourse in the centre of Section A are present in all surface water flooding events. Surface water flood extents in the 30-year event are mostly contained within or close to the channel with the estimates for the deepest water located within the channel, quickly reducing to &lt;0.3m as flooding moves out of bank. A similar pattern can be seen in the 100-year and 1,000-year events, where flooding extents extend further away from the channel to the north and south bounded within the corridor of low-lying topography. The deepest flooding estimated (&gt;0.9m) is located within the channel with shallower water of depths &lt;0.3m more widespread across areas at risk. In general, surface water flooding close to the western boundary of the site is estimated to be deeper.</p> <p>A surface water flow route enters Section A from the east in the 1,000-year event, originating from high topography to the east of the site and following the path of one of the ordinary watercourses joining in confluence at the eastern boundary. In the 30-year and 100-year event this surface water flow route does not encroach onto the site due to the embanked A429 running down the eastern boundary which acts to impound surface water running down the hillslope. Surface water flooding begins to spill over this roadway in the 1,000-year event.</p> <p>There is a surface water flow path present in the northwest of the Section A in the 1,000-year event associated with the ordinary watercourse running along the northern boundary. It extends southwards into the site, steered by an area of low topography with a maximum estimated depth of 0.3-0.9m. There are isolated areas of ponding present across Section A in localised topographic low-spots in the 1,000-year event.</p> <p>Section B is at minimal risk from surface water flooding.</p>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
	<b>Reservoir</b>	<p>Section A is not shown to be at risk of flooding from reservoirs. The Thelsford Brook and River Avon downstream of the site are shown to be at risk; however, the areas at risk do not extend upstream along the ordinary watercourses to encroach onto Section A of the site.</p> <p>The lowest-lying topography at the northern edge of Section B falls within the areas at risk of flooding from reservoirs due to its close proximity to the River Dene. However, this is only a very small area of this site and is unlikely to have a large impact due to the sloping site topography.</p>
	<b>Groundwater</b>	<p>The EA's Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> <li>The whole site is shown to have &gt;75% susceptibility to groundwater emergence.</li> </ul> <p>JBA's Groundwater Mapping dataset indicates a more varied susceptibility to groundwater flooding across the site. The mapping shows that all of Section B and the majority of Section A have groundwater levels within 0.025m of the ground surface, suggesting groundwater may emerge at the surface locally. There are some areas of the site where groundwater levels are 0.025–0.5m below the ground. These are generally located in areas of higher topography and are spread across the site in the northeast and southern parts of the site in localised areas. There are small areas of the site where ground water levels are from 0.5-5m below the ground surface. There is no risk of groundwater flooding associated with the ground surface beneath the ordinary watercourse flowing through the centre of the site.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.</p> <p>Information provided by a local stakeholder indicates that groundwater flooding levels can be correlated with levels in the River Avon, recorded via measurements from a well adjacent to the low lying land at the site.</p>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>		
	<b>Address</b>	Wellesbourne Campus		
	<b>Area</b>	133.43 hectares		
	<b>Current land use</b>	Mixed use		
	<b>Proposed land use</b>	Innovation Campus for research and development		
	<b>Flood history</b>	<p>The Environment Agency Historic Flood mapping does not indicate any incidences of historic flooding across Section A. An area along the northern border of Section B is covered by the historic flood map in association with the River Dene. Recorded Flood Outline datasets show a number of historic incidents along the River Avon and the River Dene, to the south and west of the site with the most recent outlines in this dataset showing flooding in Charlecote and Wellesbourne in July 2007. Although it is not indicated on EA historic flood mapping, local stakeholder information suggests that this site, Wellesbourne Campus, experienced extensive flooding in 1998. Following this event, channel alterations such as widening were carried out up to 2003 to alleviate future flooding. However, these mitigation measures were not effective against flooding on the site in 2007. Flooding also occurred in November 2019, with a reported 'near miss' for the University site.</p> <p>A number of recent historic flooding incidents have been recorded by Stratford-on-Avon District Council in the vicinity of Section A with approximately 9 incidences recorded in Wellesbourne and 3 within Charlecote. Section B, to the south of the River Dene is located within 500m of a historic flood incident recorded by Stratford-on-Avon District Council.</p>		
<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.		

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
	<b>Residual risk</b>	<p>An unnamed road bounds the site along its western border. Both ordinary watercourses that flow through Section A must cross this road immediately downstream of the site, likely through hydraulic structures such as culverts, although this is unclear on mapping. If these culverts were to become blocked there is potential that water would back up behind the structures, causing more extensive flooding on Section A of the development site.</p> <p>At the eastern boundary watercourses must cross the A429 before entering the site. The embanked level of the A429 acts to impound water and prevents it from flowing onto the site in the lower return period events. If these hydraulic structures were to become blocked, there is potential for additional water to become impounded behind the A429, causing it to spill over onto the development site and cause more extensive flooding.</p> <p>A site-specific FRA should investigate the impacts of blockage of these hydraulic structures in both fluvial and surface water flooding events to confirm risk to the site as well as to help inform finished floor levels, particularly in climate change scenarios.</p>
<b>Emergency planning</b>	<b>Flood warning</b>	<p>The ordinary watercourse flowing through the centre of Section A falls within the Environment Agency's Middle Avon Rugby to Bidford Flood Alert Area (033WAF204). The northern boundary of Section falls into the Environment Agency's River Dene in South East Warwickshire Flood Alert Area (033WAF206).</p> <p>The site does not fall within the Environment Agency Flood Warning Areas.</p>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
	<b>Access and egress</b>	<p>The main access and egress routes for Section A of the site are located on the A429 along the eastern boundary or along Charlecote Road on the southern boundary, although there are roads with potential for access bordering all four sides of this site.</p> <p>Access and egress to Section A is possible in all surface water events. There is some indication of ponding along the A429 on the eastern boundary in the 1,000-year event but depths are estimated to be &lt;0.3m so it is likely that emergency services will still be able to gain access to the site. There is potential that access routes along the A429 are inundated by fluvial Flood Zones 2 and 3, however alternative access routes from the southern end of the site along Charlecote Road are clear of flooding in all fluvial events.</p> <p>Although the site is bisected north to south by an area of higher flood risk, it is possible to gain access from the north and the south ends of the site.</p> <p>Section B can be accessed from Stratford Road along its southern border. There is minimal risk of fluvial flooding along access and egress routes. Access and egress is possible in all surface water events. There are some areas of ponding along key access route roadways in Wellesbourne to the east of the site in all events and some isolated ponding along Stratford Road to the west in the 1,000-year event. However, this is estimated to have a maximum depth of 0.3m in the 30-year and 100-year events and a maximum depth of 0.3-0.9m in the 1,000-year events. This means that it is likely that emergency services will be able to gain access to this site during a flood event.</p> <p>A site-specific Flood Risk Assessment should be undertaken to evaluate accessibility to pedestrians and vehicles to both sections of this site.</p>

<p><b>Climate Change</b></p>	<p><b>Implications for the site</b></p>	<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 modelling data currently available at this site, therefore Flood Zone 2 has been used as a conservative indication of potential impacts of climate change on fluvial flooding for unnamed watercourse running through the centre of Section A and for the River Dene close to Section B. Fluvial flood risk at Section B does not significantly increase due to climate change due to the topography of the site. More extensive flooding can be seen in Section A with Flood Zone 2 extending further into the site away from the ordinary watercourse.</li> <li>• It is recommended that developers undertake further modelling at the site-specific FRA stage to determine whether the site may be at risk of flooding in the future. The detailed modelling study should test the 2080s climate change allowances in a hydraulic model, to ascertain the impact at the site. Climate change should also 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>• At a detailed assessment stage, the impacts of climate change on the functional floodplain may need to be considered. This is likely to resemble the increase in extent from Flood Zone 3b (20-year extent) to Flood Zone 3a (100-year extent), for the purposes of a strategic assessment.</li> <li>• 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 due to climate change. It has also been used to consider the effects of climate change on flooding close to the unnamed ordinary watercourses at the northern boundary of the site and at the eastern boundary of the site where flooding is not represented by fluvial Flood Zone data.</li> <li>• The 1,000-year surface water extent covers 11% of the site and is particularly significant in the areas of low-topography through the centre of the site and close to the eastern boundary. A surface water flow route running from high ground to the east onto the site is activated in the 1,000-year event as water overtops the A429.</li> <li>• Developers should consider SuDS strategies to reduce the potential impacts of climate change from surface water in a detailed site-specific FRA which would be required to assess the site layout and design.</li> </ul>
<p><b>Requirements for drainage control and impact mitigation</b></p>	<p><b>Broad scale assessment of possible SuDS</b></p>	<p>Geology at the site consists of:</p> <ul style="list-style-type: none"> <li>○ Bedrock – Mercia Mudstone Group – mudstone.</li> <li>○ Superficial – River Terrace Deposits, sand and gravel. Alluvium – clay, silt, sand and gravel.</li> <li>○ Most source control techniques are likely to be suitable. Mapping suggests that slopes may be unsuitable for selective source control techniques.</li> </ul>

		<p>The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</p> <ul style="list-style-type: none"> <li>○ Mapping suggests that there is a high risk of groundwater flooding at this location, therefore it is likely infiltration techniques will not be suitable. This should be confirmed via site investigations to assess the potential for infiltration.</li> <li>○ This option is unlikely to be feasible as mapping suggests mean site slopes are &gt; 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.</li> </ul> <p>The site is considered to be highly susceptible to groundwater flooding. Groundwater flooding could occur at the surface which may flow to and pool within topographic low spots during very wet winters. Detention and attenuation features should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate at this site.</p> <ul style="list-style-type: none"> <li>○ This option is unlikely to be feasible as mapping suggests mean site slopes are &gt; 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 &gt;1m, additionally a liner maybe required to prevent the egress of groundwater.</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. A liner maybe required to prevent the egress of groundwater.</li> <li>○ The site is not designated by the Environment Agency as previously being a landfill site.</li> <li>○ The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.</li> </ul>
<p><b>NPPF and planning implications</b></p>	<p><b>Exception Test requirements</b></p>	<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.</p> <p>Residential development is classified as 'More Vulnerable' and Employment development is classified as 'Less Vulnerable'. For mixed use developments, the highest level of vulnerability should be considered. 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>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
		<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>• The development may introduce a more vulnerable use. A detailed site-specific FRA will also be required where development sites: <ul style="list-style-type: none"> <li>◦ Contain land which has been identified by the EA as having critical drainage problems; or</li> <li>◦ Contain land identified in the strategic flood risk assessment as being at increased flood risk in the future.</li> </ul> </li> <li>• Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.</li> <li>• A detailed hydraulic model may be required at FRA stage, to confirm flood risk, flow paths and climate change extents from the unmodelled watercourses, using channel topographic survey.</li> <li>• Blockage residual risk will need to be investigated and modelled in a detailed FRA to confirm impacts and help inform finished floor levels.</li> <li>• All sources of flooding, particularly the risk of fluvial, surface water and groundwater flooding, should be considered as part of a site-specific FRA.</li> <li>• Flood risk needs to be considered for the lifetime of the development, accounting for climate change. Any FRA should be carried out in line with the National Planning Policy Framework.</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, particularly in the low-lying topography through the centre of the site, 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>• If a detailed model shows the western boundary to be in Flood Zone 3, development in FZ3b should be avoided unless appropriate use can be demonstrated in line with NPPF. 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</li> </ul>
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		<p>on surface water flow routes. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.</p> <ul style="list-style-type: none"> <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 and no increase in downstream discharge from the site.</li> <li>• On site attenuation schemes would need to be tested against the watercourses 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>• Developers should refer to Warwickshire County Council's <a href="#">'Surface Water Management Plan'</a>, Stratford on Avon District's <a href="#">'Core Strategy 2011 to 2031'</a> and the <a href="#">Level 1 SFRA</a> for information on SuDS.</li> <li>• All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.</li> <li>• SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.</li> <li>• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.</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>
<p><b>Key messages</b></p>		<p>The site is likely to be suitable for development subject to:</p> <ul style="list-style-type: none"> <li>• Development is preferentially located in areas at lower risk of fluvial flood risk. Flood risk across this site is primarily located in areas of lower-lying topography. Development should be steered towards land at a higher elevation which is less susceptible to fluvial and surface water flood risk.</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) and will not be detrimental to flood risk downstream of the site.</li> </ul>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Wellesbourne Campus [RURAL.2]</b>
	<b>Address</b>	Wellesbourne Campus
	<b>Area</b>	133.43 hectares
	<b>Current land use</b>	Mixed use
	<b>Proposed land use</b>	Innovation Campus for research and development
		<ul style="list-style-type: none"> <li>Space for green infrastructures or storage of flood waters 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>		
<p>The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning and the Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.</p>		
<b>Flood Zones</b>	<p>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 FRA stage, to confirm flood risk.</p>	
<b>Climate change</b>	<p>Climate change mapping was unavailable for this area. In the absence of Flood Zone 2 as an indication of fluvial climate change, the 1,000-year surface water flooding event was used as an indicative climate change scenario. It is recommended that the latest EA's climate change allowances are modelled in a detailed hydraulic model as part of a site-specific FRA.</p>	
<b>Fluvial depth, velocity and hazard mapping</b>	<p>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.</p>	
<b>Surface Water</b>	<p>The Risk of Flooding from Surface Water map has been used to define areas at risk from surface water flooding.</p>	
<b>Surface water depth, velocity and hazard mapping</b>	<p>The surface water depth, velocity and hazard mapping for the 1 in 100-year event (considered to be medium risk) is taken from Environment Agency's Risk of Flooding from Surface Water.</p>	

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>			
	<b>Address</b>	Quinton Rail Technology Centre			
	<b>Area</b>	70.06 hectares			
	<b>Current land use</b>	Mixed Use			
	<b>Proposed land use</b>	Rail based innovation and technology centre			
<b>Sources of flood risk</b>	<b>Location of site within catchment</b>	<p>The site is located on the eastern edge of Meon Vale and lies in the upper reaches of a sub-catchment of the Marchfont Brook. The Marchfont Brook drains into the River Avon at Weston-on-Avon. The site slopes downhill towards the north.</p> <p>The site is comprised of predominantly rural land or woodland with railway infrastructure such as tracks, and buildings also present on site. Station Road borders the site to the north.</p>			
	<b>Existing drainage features</b>	<p>A number of watercourses identified in the Environment Agency's Detailed River Network pass through the site. Gran Brook bisects the site flowing from south to north through its centre. An unnamed ordinary watercourse flows northwest from Meon Vale and meets the eastern border of the site where it flows northwards joining in confluence with the Gran Brook approximately 460m downstream of the site. It also joins with another unnamed ordinary watercourse, which flows north-west along the roadway, at the northeast corner of the site on Station Road.</p> <p>An additional drainage channel diverts water from the Gran Brook, approximately 150m upstream of the site, diverting it around the southeast section of the site to pass through the woodland area in the northeast of the development site where it joins the unnamed ordinary watercourse along the eastern boundary. There are two standing waterbodies present in the northeast of the site.</p>			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>			
		<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
		1%	1%	6%	94%
<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>					
Medium					
<p><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></p>					

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>		
	<b>Address</b>	Quinton Rail Technology Centre		
	<b>Area</b>	70.06 hectares		
	<b>Current land use</b>	Mixed Use		
	<b>Proposed land use</b>	Rail based innovation and technology centre		
<b>Surface Water</b>	<p><b>Available data:</b> The Environment Agency's Flood Zone mapping has been used in this assessment. The Gran Brook catchment is &lt;3km<sup>2</sup>, and hence is not represented in the EA's Flood Zones.</p> <p><b>Flood characteristics:</b> Fluvial flood risk on this site, indicated by the Environment Agency Flood Risk mapping, is primarily associated with the unnamed drainage channel passing through the woodland in the eastern area of the site and is focused in an area of lower topography. Flood Zones 3b and 3a primarily remain in the area surrounding the channel. Flood Zone 2 extends away from the channel and slightly along the eastern border where the unnamed watercourses join in confluence. Directly downstream of the site, along the northern border at Station Road, Flood Zones 2, 3a and 3b extend laterally to the east and west away from the channel. Additionally, in this northeast corner of the site where there is a confluence of watercourses, if the channel flowing alongside Station Road from the southeast is out of bank, it could restrict downstream flow of other watercourses and cause flow to back up onto the site in the northeast.</p> <p>The Gran Brook, passing through the centre of the site, is not shown on the EA's Flood Zones as the catchment is &lt;3km<sup>2</sup>. For this reason, this ordinary watercourse does not appear to pose a risk of fluvial flooding across the site. At a site-specific Flood Risk Assessment stage, a detailed hydraulic model of this watercourse should be developed to confirm fluvial flood risk to the site.</p> <p>In the absence of any detailed models in this area, the surface water flood risk datasets can be used as an indication of extents, depths and velocities for smaller ordinary watercourses.</p>			
	<b>Proportion of site at risk (RoFfSW)</b>			
	<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>	
	10%	18%	41%	
	Max depths (m)			
	0.3-0.9	0.3-0.9	0.3-0.9	
	Max velocity (m/s)			
	>0.25	>0.25	>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>				

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>
	<b>Address</b>	Quinton Rail Technology Centre
	<b>Area</b>	70.06 hectares
	<b>Current land use</b>	Mixed Use
	<b>Proposed land use</b>	Rail based innovation and technology centre
		<p><b>Description of surface water flow paths:</b></p> <p>Surface water flooding poses a significant risk across this site with flow paths and areas of isolated ponding present across the site in all design events (30-year, 100-year, and 1,000-year). The northeast area of the site, which is at a lower elevation, is the worst impacted with ponding in all events associated with the two watercourses meeting in this area, spreading away from the channels and collecting in the standing waterbodies present in the northeast corner of the site.</p> <p>Boundary Road West, which passes through the site from north to south acts as a flow path to convey surface water during all events. Ponding also occurs in the northwest of the site with isolated areas in the 30-year and 100-year events and a more extensive coverage in the 1,000-year event as isolated areas begin to join to form flow routes towards the north, steered by the sloping topography. There is a noticeable area of ponding at the western edge of the site at the junction of unnamed tracks.</p> <p>In the 30-year and 100-year events, the majority of surface water flooding indicated on the site is less than 0.3m in depth, with only isolated areas of ponding at a depth of 0.3-0.9m. As surface water flooding extents grow in the 1,000-year event, there are more extensive areas of the site at risk of flooding at a depth of 0.3-0.9m, particularly in the northeast of the site.</p>
	<b>Reservoir</b>	This site is not shown to be at risk of flooding from reservoirs.
	<b>Groundwater</b>	<p>The EA's Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> <li>• The southern part of the site is shown to have &lt;25% susceptibility to groundwater flood emergence.</li> <li>• The majority of the site is not susceptible to flooding from groundwater.</li> </ul> <p>JBA's Groundwater Mapping dataset shows that the site is at no risk from groundwater flooding.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.</p>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>		
	<b>Address</b>	Quinton Rail Technology Centre		
	<b>Area</b>	70.06 hectares		
	<b>Current land use</b>	Mixed Use		
	<b>Proposed land use</b>	Rail based innovation and technology centre		
	<b>Flood history</b>	<p>The Environment Agency Historic Flood mapping does not indicate any incidences of historic flooding across this site. One incident has been recorded by Stratford on Avon District Council within Meon Vale to the southeast of the site.</p> <p>Photographic evidence collected by a Meon Vale resident in December 2020 indicates that parts of the woodland close to and within this site have been recently flooded. This is an area already identified within Flood Zones 3a and 2 but highlights that parts of this site may be unsuitable for housing development.</p>		
<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>	<p>The two watercourses (Gran Brook and the unnamed ordinary watercourse) leave the site flowing northwards across Station Road. It is unclear whether this is via a culvert or bridge structure. If a structure in this location became blocked, constricting flow downstream, flooding could extend upstream onto the development site.</p> <p>A site-specific FRA should investigate the impacts of blockage of hydraulic structures surrounding the site and coincident flood peaks passing through the various watercourses to confirm risk to the site as well as to help inform finished floor levels, particularly in climate change scenarios.</p>		
<b>Emergency planning</b>	<b>Flood warning</b>	The northeast area of the site is covered by the Environment Agency's Middle Avon Rugby to Bidford Flood Warning Area (033WAF204).		

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>
	<b>Address</b>	Quinton Rail Technology Centre
	<b>Area</b>	70.06 hectares
	<b>Current land use</b>	Mixed Use
	<b>Proposed land use</b>	Rail based innovation and technology centre
	<b>Access and egress</b>	<p>The main route of access and egress to the site is gained from Station Road, which runs along the northern boundary or from Boundary Road West which enters the site at the southeast boundary. Access to the site is possible from Station Road in all fluvial flooding events if the approach is made from Long Marston Road to the west of the site. Flood Zones 3b, 3a and 2 are shown to inundate a section of Station Road in the northeast corner of the site. This area is at a medium risk of flooding with a 1-3.3% chance of flooding occurring in any year according to the Environment Agency Risk of Flooding from Rivers and Sea mapping datasets.</p> <p>Ponding of flood water is present in all surface water flooding events along Station Road with a flow route passing over the roadway at the northeast corner of the site, where two watercourses meet. Additionally, a surface water flow route inundates Station Road at the northwest corner of the site in the 1,000-year event. According to the Environment Agency surface water flood risk mapping the maximum depth of flood water estimated along Station Road is 0.3m with a velocity of &gt;0.25m/s. Ponding occurs in all surface water events where Boundary Road West enters the site in the southeast with a maximum depth estimated at 0.3-0.9m in the 1000-year event. Alternative access to the southern area of the site could potentially be gained from Long Marston Road which runs close to the western border of the site and is minimally impacted by surface water risk.</p>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>
	<b>Address</b>	Quinton Rail Technology Centre
	<b>Area</b>	70.06 hectares
	<b>Current land use</b>	Mixed Use
	<b>Proposed land use</b>	Rail based innovation and technology centre
<b>Climate Change</b>	<b>Implications for the site</b>	<ul style="list-style-type: none"> <li>The majority of the site is not shown to be at current risk of fluvial flooding. Currently Flood Zone 2 has been used as a conservative indication of fluvial flood risk from climate change as no detailed modelling is available. Flood Zone 2 extends laterally away from the channel into the wooded area in the northeast of the site, covering a total of 6% of the site.</li> <li>It is recommended that developers undertake further modelling of all the ordinary watercourses passing through the site at the site-specific FRA stage to determine whether the site may be at risk of flooding in the future. The detailed modelling study should test the 2080s climate change allowances in a hydraulic model, to ascertain impact at the site which may refine future risk in the eastern area of the site and along Gran Brook through the centre of the site.</li> <li>At a detailed assessment stage, the impacts of climate change on the functional floodplain may need to be considered. This is likely to resemble the increase in extent from Flood Zone 3b (20-year extent) to Flood Zone 3a (100-year extent), for the purposes of a strategic assessment.</li> <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>Climate change should also 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 flooding extent provides an indication of the likely increase in extent of the more frequent surface water events. The 1000-year surface water flooding extent covers 41% of this site so a detailed FRA would be required 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>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>
	<b>Address</b>	Quinton Rail Technology Centre
	<b>Area</b>	70.06 hectares
	<b>Current land use</b>	Mixed Use
	<b>Proposed land use</b>	Rail based innovation and technology centre
<b>Requirements for drainage control and impact mitigation</b>	<b>Broad scale assessment of possible SuDS</b>	<p>Geology at the site consists of:</p> <ul style="list-style-type: none"> <li>• Bedrock – Blue Lias Formation and Charmouth Mudstone Formation (undifferentiated) - Mudstone.</li> <li>• Superficial – No superficial geology indicated</li> </ul> <ul style="list-style-type: none"> <li>• All forms of source control are likely to be suitable. The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</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>• The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.</li> </ul>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>
	<b>Address</b>	Quinton Rail Technology Centre
	<b>Area</b>	70.06 hectares
	<b>Current land use</b>	Mixed Use
	<b>Proposed land use</b>	Rail based innovation and technology centre
<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' and Employment development is classified as 'Less Vulnerable'. For mixed use developments, the highest level of vulnerability should be considered.</p> <p>It is recommended that proposed development will be sequentially located within Flood Zone 1 areas of the site. 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>

**Requirements and guidance for site-specific Flood Risk Assessment**

**Flood Risk Assessment:**

- At the planning application stage, a site-specific Flood Risk Assessment will be required as watercourses pass through and border the development site. It may also be subject to other sources of flooding and the development may introduce a more vulnerable use. It will also be required where development sites:
  - Are 1 hectare or more in size;
  - Contain land which has been identified by the EA as having critical drainage problems; or
  - Contain land identified in the strategic flood risk assessment as being at increased flood risk in the future.
- A more detailed hydraulic model may be required at FRA stage, to confirm flood risk and flow paths, FZ3b and climate change extents from the Gran Brook and unnamed ordinary watercourses, using channel topographic survey.
- Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.
- All sources of flooding, particularly the risk of fluvial, surface water and groundwater flooding, should be considered as part of a site-specific FRA.
- Flood risk needs to be considered for the lifetime of the development, accounting for climate change.
- 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, particularly in the eastern area of the site, preserving these areas as green infrastructure.
- Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Stratford on Avon District Council's Local Plan policies, the LLFA's (Warwickshire County Council) '[Surface Water Management Plan](#)' and '[Stratford on Avon District Core Strategy 2011 to 2031](#)'.
- Development in FZ3b should be avoided unless appropriate use can be demonstrated in line with NPPF. Development in FZ3 may require floodplain compensation and this should be confirmed with the EA at FRA stage.

**Guidance for site design and making development safe:**

- 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. No assessment of future flood risk with regard to climate change has been made. 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).
- 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.

		<ul style="list-style-type: none"> <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 and no increase in downstream discharge from the site.</li> <li>• On site attenuation schemes would need to be tested against the watercourses 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>• Developers should refer to Warwickshire County Council's '<a href="#">Surface Water Management Plan</a>', Stratford on Avon District's '<a href="#">Core Strategy 2011 to 2031</a>' and the <a href="#">Level 1 SFRA</a> for information on SuDS.</li> <li>• All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.</li> <li>• SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.</li> <li>• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.</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>
<p><b>Key messages</b></p>		<p>The site is likely to be suitable for development subject to:</p> <ul style="list-style-type: none"> <li>• Development is steered away from surface water ponding in areas of lower-lying topography on the eastern side of the site and the northwest. The south and west of the site which lie at higher elevation are less susceptible to fluvial or surface water flood risk.</li> <li>• A detailed hydraulic model may be needed at site-specific stage to confirm the flood risk to the site and the impacts of climate change, and development should be steered away from the Flood Zones.</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> </ul>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Quinton Rail Technology Centre [RURAL.3]</b>
	<b>Address</b>	Quinton Rail Technology Centre
	<b>Area</b>	70.06 hectares
	<b>Current land use</b>	Mixed Use
	<b>Proposed land use</b>	Rail based innovation and technology centre
		<ul style="list-style-type: none"> <li>Space for green infrastructure should be considered in the areas of highest flood risk.</li> <li>Access and egress to the site along Station Road in all surface water events is considered or alternative routes of access at the southern end of the site are identified.</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 datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning and the Risk of Flooding from Surface Water map. 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 FRA stage, to confirm flood risk.	
<b>Climate change</b>	Climate change was based on Flood Zone 2 to serve as an indication of possible fluvial flooding extents. The 1,000-year surface water flooding event was used as an indicative surface water climate change scenario. It is recommended that the latest EA's climate change allowances are modelled in a detailed hydraulic model as part of a site-specific FRA.	
<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 map 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 100-year event (considered to be medium risk) is taken Environment Agency's Risk of Flooding from Surface Water.	

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>			
	<b>Address</b>	Meon Vale			
	<b>Area</b>	32.08 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>	This site's southern boundary makes up part of the western border between the Stratford-on-Avon district and Wychavon district. This site encompasses the the surrounding woodlands and greenfield of Meon Vale Business Park. The site covers a significant proportion of Meon Vale. This site is located in the middle of the River Avon catchment, as it does not reach its confluence with the Severn for some distance beyond the district.			
	<b>Existing drainage features</b>	The Environment Agency's Detailed River Network shows several drainage features within the site and it is fairly complex when inspecting mapping, to determine which drains connect. The source of the Gran Brook is just south of the site, adjacent to Meon Hill; this flows north to the site. At the site, the Gran Brook bifurcates into a series of channels between the railway lines of the railway technology centre and another unnamed drain along the eastern boundary of the site. It then flows under a culvert at the northern site boundary and continues north of Station Road, joining the Marchfront Brook shortly before the confluence with the Avon.			
	<b>Fluvial</b>	<b>Proportion of site at risk</b>			
		<b>FZ3b</b>	<b>FZ3a</b>	<b>FZ2</b>	<b>FZ1</b>
		0%	1%	13%	87%
		<b>Highest zone of risk (Risk of Flooding from Rivers and Sea)</b>			
Medium					
<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>					

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>		
	<b>Address</b>	Meon Vale		
	<b>Area</b>	32.08 hectares		
	<b>Current land use</b>	Greenfield		
	<b>Proposed land use</b>	Residential		
		<p><b>Available data:</b> The Environment Agency's (EA) Flood Zone mapping has been used in this assessment. There is no detailed modelling and therefore this is based on 2D generalised modelling.</p> <p><b>Flood characteristics:</b> The Environment Agency's Flood Zones are partially present at the site, just at the northern end of the site; this is because the catchment upstream of this point is &lt;3km<sup>2</sup> and hence is not represented. This does not mean there is no risk posed by the other watercourses in the site, but there is no data available. Flood Zone 2 is present at the site, within the woods just beyond the western boundary. Flood Zones 3a is also present in the same area as Flood Zone 2; however, this is confined to the channel. Flood Zone 3a follows along the ordinary watercourse that flows through the woodlands and then east to the boundary. This then extends northward. A detailed site-specific assessment will need to confirm the flood risk from the various drainage channels of the Gran Brook, where these split, re-join and how they interact with the various railway lines. The surface water mapping may provide an indication of risk in the absence of fluvial data.</p>		
	<b>Surface Water</b>	<b>Proportion of site at risk (RoFfSW)</b>		
		<b>30-year</b>	<b>100-year</b>	<b>1,000-year</b>
		23%	34%	60%
		Max depths (m)		
		0.3-0.9m	0.3-0.9m	0.3-0.9m
		Max velocity (m/s)		
		Over 2.5m/s	Over 2.5m/s	Over 2.5m/s
		<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>		

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>
	<b>Address</b>	Meon Vale
	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
		<p><b>Description of surface water flow paths:</b></p> <p>This site has been flagged for surface water flooding concerns. The site is shown to be impacted by surface water flows in all events. The flow routes are all quite different, with some being long and narrow following drainage channels, ploughed fields and railway lines where topographically incised, and other areas to the east are larger wide swathes of risk around the drainage channels and their floodplain.</p> <p>In the 30-year event, surface water flows are largely confined along the drainage routes. The extent is larger on the drain flowing through the woodland to the east, with significant ponding along the eastern boundary, where the topography is lower. There is further localised ponding across the site in other areas of low topography.</p> <p>In the 100-year event, surface water flows follow similar patterns, along the drainage routes and railway lines. The extents are larger than those experienced in the 30-year events, with further localised ponding in other parts of the site.</p> <p>In the 1,000-year event, these surface water flows extend largely across a large proportion of the eastern half of the site, along all the drains present in the site and there is additional ponding across all areas of the site. There are areas of the site not at risk in the centre/ to the west, but the 1,000-year event covers 60% of the site in total. All flood depths are in the region of 0-0.9m. Most flooding is shallow, less than 0.3m, with isolated ponding areas of 0.3-0.9m. The 1,000-year has a larger extent of deeper flooding, similar to the extent of the 100-year event. Similarly with velocities, most tend to be less than 0.25m/s with narrow reaches long channels or flow paths of greater than 0.25m/s.</p> <p>It may be that detailed surface water modelling would be beneficial and this may refine the mapping.</p>
	<b>Reservoir</b>	The site is not shown to be at risk of reservoir flooding from the available <a href="#">online</a> maps.

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>		
	<b>Address</b>	Meon Vale		
	<b>Area</b>	32.08 hectares		
	<b>Current land use</b>	Greenfield		
	<b>Proposed land use</b>	Residential		
	<b>Groundwater</b>	<p>The EA's Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> <li>• The lower quarter of the site has less than 25% susceptibility to groundwater flood emergence.</li> <li>• The remaining area of the site has no susceptibility to groundwater flood emergence.</li> </ul> <p>JBA's Groundwater Mapping dataset shows that the whole site has 'no risk', suggesting that groundwater is more than 5m below the surface. This suggests groundwater is unlikely to emerge at the surface locally.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.</p>		
	<b>Flood history</b>	This site is not shown to be within the reaches of the Environment Agency's Historic Flood Map. There are however, incidences of flooding near the site. Moreover, local residents have recorded flooding to the woodland in late December 2020.		
<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>	There are several culverts, within the site in the woodlands, on Gran Brook just outside the site and on the watercourses along the site boundary. Blockage risk to any and/or all of these is likely to increase the risk of fluvial flooding to the site, particularly where the structures are against embankments which would impound the water. A site-specific risk assessment is recommended to investigate these potential risks further.		
	<b>Flood warning</b>	The site is not covered by the Environment Agency's Flood Warning Service.		

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>
	<b>Address</b>	Meon Vale
	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<b>Emergency planning</b>	<b>Access and egress</b>	Access and egress at this site are possible via Station Road, along the northern boundary and a range of smaller residential roads to the east off Meon Vale; however, the amount of surface water risk needs to be considered here as there are several parts of the site where flow routes bisect and therefore make access across the site to the roads difficult. Station Road itself is also at risk of surface water flooding in sections, mostly in the 1,000-year but with some isolated pockets in the 30 and 100-year events. A site-specific Flood Risk Assessment should be undertaken to evaluate the overall accessibility to pedestrians and vehicles.

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>
	<b>Address</b>	Meon Vale
	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<b>Climate Change</b>	<b>Implications for the site</b>	<ul style="list-style-type: none"> <li>• It is recommended that developers undertake further modelling at the site-specific FRA stage to determine whether the site may be at risk of flooding in the future. The detailed modelling study should test the 2080s climate change allowances in a hydraulic model, to ascertain the impact at the site. The area of Flood Zone 2 can be used as an indication, but as there is only partial coverage of Flood Zones, the 1,000-year surface water mapping dataset can be used as an indication of climate change.</li> <li>• At a detailed assessment stage, the impacts of climate change on the functional floodplain may need to be considered. This is likely to resemble the increase in extent from Flood Zone 3b (20-year extent) to Flood Zone 3a (100-year extent), for the purposes of a strategic assessment.</li> <li>• Climate change should also be considered for surface water events; at the site-specific stage, the 100-year +40% should be considered as part of surface water drainage strategies, or surface water modelling.</li> <li>• 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. This could mean a large proportion of the site is at risk in the future, particularly the eastern portion where risk is highest. 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>

# Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>
	<b>Address</b>	Meon Vale
	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<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 – Blue Lias Formation And Charmouth Mudstone</li> <li>○ Superficial – None recorded</li> </ul> </li> <li>• All forms of source control are likely to be suitable. The site is considered to have very low susceptibility to groundwater flooding, this should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.</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>• The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.</li> </ul>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



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	<b>Address</b>	Meon Vale
	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<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. As there is only partial Flood Zone coverage, a detailed model may need to be produced at site-level assessment to understand the flood risk to the remaining areas of the site from the Gran Brook. Alongside this, the surface water risk should also be considered as it is significant.</p> <p>The Exception test will need to be applied if:</p> <ul style="list-style-type: none"> <li>• Highly Vulnerable development is located in FZ2.</li> <li>• More vulnerable development is located in FZ3a</li> </ul>

**Requirements and guidance for site-specific Flood Risk Assessment**

**Flood Risk Assessment:**

- 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. This site falls under these requirements.
- Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage.
- All sources of flooding, particularly the risk of fluvial, surface water and groundwater flooding, should be considered as part of a site-specific Flood Risk Assessment.
- Flood risk needs to be considered for the lifetime of the development, accounting for climate change.
- As there is only partial Flood Zone coverage, a detailed model may need to be produced at site-level assessment to understand the flood risk to the remaining areas of the site from the Gran Brook. This will confirm the Flood Zone coverage and impacts of climate change, using channel and structure topographic survey.
- Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Stratford on Avon District Council's Local Plan policies, the LLFA's (Warwickshire County Council) '[Surface Water Management Plan](#)' and '[Stratford on Avon District Core Strategy 2011 to 2031](#)'.
- The development should be designed using a sequential approach. Development should be steered away from areas of fluvial flood risk flow routes on the western boundary, preserving this as green infrastructure. Development must be in line with Table 3: flood risk vulnerability and flood zone compatibility of the NPPG.

**Guidance for site design and making development safe:**

- 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).
- 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 on Station Road (access point).
- 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.
- 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.

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



Site details	Site Code	Meon Vale [Rural.4]
	Address	Meon Vale
	Area	32.08 hectares
	Current land use	Greenfield
	Proposed land use	Residential
		<ul style="list-style-type: none"> <li>• On site attenuation schemes would need to be tested against the watercourse 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> <li>• Developers should refer to Warwickshire County Council's '<a href="#">Surface Water Management Plan</a>', Stratford on Avon District's '<a href="#">Core Strategy 2011 to 2031</a>' and the <a href="#">Level 1 SFRA</a> for information on SuDS.</li> <li>• All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.</li> <li>• SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.</li> <li>• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.</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>

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



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	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential

### Key messages

The site is likely to be suitable for development subject to:

- A detailed site-specific assessment confirms the flood risk from the various drainage channels of the Gran Brook, where these split, re-join and how they interact with the various railway lines. It may be that detailed surface water modelling would be beneficial and this may refine the mapping. Development will need to be steered away from these areas of flood risk.
- Development should also be steered away from the areas of significant surface water flood risk to the east. Developing in flow conveyance routes may displace flood water elsewhere in the site or to third party land.
- Safe access and egress need to be considered and the impacts of surface water flooding to Station Road are assessed. The amount of surface water risk needs to be considered as there are several parts of the site where flow routes bisect and therefore make access across the site to the roads difficult.
- If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere.
- Space for green infrastructure should be considered in the areas of highest flood risk.
- A site-specific FRA demonstrates that the site is not at an increased risk of flooding in the future as a result of climate change, and that the development of the site does not increase the risk of flooding on the site and to neighbouring properties.

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 were the Environment Agency's Flood Map for Planning and the Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.

## Stratford on Avon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables



<b>Site details</b>	<b>Site Code</b>	<b>Meon Vale [Rural.4]</b>
	<b>Address</b>	Meon Vale
	<b>Area</b>	32.08 hectares
	<b>Current land use</b>	Greenfield
	<b>Proposed land use</b>	Residential
<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 FRA stage, to confirm flood risk.
<b>Climate change</b>		Climate change mapping was unavailable for this area. In the absence of Flood Zone 2 (for the majority of the site) as an indication of fluvial climate change, the 1,000-year surface water flooding event was used as an indicative climate change scenario. It is recommended that the latest EA's climate change allowances are modelled in a detailed hydraulic model as part of a site-specific FRA.
<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 100-year event (considered to be medium risk) is taken Environment Agency's Risk of Flooding from Surface Water.