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

Site details	**Site Code**	**CST021**
	Address	Snatchfield Farm, Snatchers Lane, Church Stretton
	Area	4.18 hectares
	Current land use	Greenfield
	Proposed land use	Residential
Sources of flood risk	**Location of site within catchment**	Church Stretton and the Long Mynd forms the middle ground between two different catchments: one towards the south where flows from the Shropshire Hills flow into the Marsh Brook, joining the Byrne Brook and subsequently Quinny Brook and River Onny to the Teme. The other flows towards the north, where Town Brook flows north to become Betchett Brook and Cound Brook and in turn the River Severn. This site is located on steep ground, sloping downwards to the northwest with the lowest lying topography in the northern part of the site. It is surrounded by higher ground to the west, south and east.
	Existing drainage features	The Environment Agency have advised that an unnamed ordinary watercourse runs northwest through the site from the southeast corner to the northwest corner, leaving the site at the boundary with The Bridleways.
	Fluvial	**Proportion of site at risk**

FZ3b	FZ3a	FZ2	FZ1
0%	0%	0%	100%

Highest zone of risk (Risk of Flooding from Rivers and Sea)
N/A
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%)
Available data: There is no Flood Zone 2D generalised mapping at the site as the catchment is smaller than 3km^2. **Flood characteristics:** The Flood Map for Planning indicates that this site lies is not within Flood Zones 2 or 3. However, this does not mean there is no fluvial risk as the unnamed watercourse through the site has not been modelled due to its small catchment size so fluvial risk is largely unknown. Runoff is likely to be rapid given the site's location in the foothills of a watershed at Windy Ridge. The surface water mapping will therefore provide an indication at this strategic scale.

Surface Water	**Proportion of site at risk (RoFfSW)**	
30-year	**100-year**	**1,000-year**
3%	5%	11%
Max depths (m)		
<0.3m	<0.3m	<0.3m
Max velocity (m/s)		
>0.25	>0.25	>0.25

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		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 %)		
		Description of surface water flow paths: A surface water flow path crosses the site, steered by low-lying topography. It enters the site in the southeast corner tracking northwards close to the east boundary before crossing the site to the northwest boundary where the site meets The Bridleways. Surface water flooding is present along this flow route in all events. It is likely that this surface water flow path is indicative of fluvial flooding from the unmodelled watercourse. The site lies at the bottom of a slope with the area of lowest-lying topography along the eastern boundary and into the northern area of the site. These topographical characteristics could leave the site vulnerable to flooding if there are large amounts of surface water runoff from the higher ground surrounding the site.		
	Reservoir	The site is not shown to be at risk of reservoir flooding from the available online maps.		
	Flood history	There are no records of historic flooding at the site from the Environment Agency. In the Level 1 SFRA completed in 2018, 23 recorded flood incidents were identified in Church Stretton by Severn Trent Water and Welsh Water. One flooding incident was recorded in Church Stretton in February 2020. No recorded historical flood incidents occurred within 200m of the proposed development site.		
Flood risk management infrastructure	**Defences**	**Defence Type**	**Standard of Protection**	**Condition**
		-	-	-
		This site is not protected by any formal flood defences.		
	Residual risk	If there is an ordinary watercourse present through the site as stated, it is likely that this goes into a culvert under the residential area at the northern end of the site. This would need to be confirmed in a site-specific assessment.		
	Flood warning	The site is not covered by the Environment Agency's Flood Warning Service.		

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Emergency planning	**Access and egress**	Access to the site can be gained from Chelmick Drive, in the southwest of the site, via the A49 in all surface water events. There are some isolated areas of surface water ponding on the A49 and Crossways in the 30-year surface water event. The depth of this surface water is estimated to reach maximum levels of 0.3-0.9m so access and egress for emergency vehicles is likely to still be possible. The area of the A49 close to the site and a key route for vehicular access and egress to the site lies within Flood Zones 2 and 3. A pedestrian access route to the site has been identified following Ragleth Road, Clive Avenue and a public right of way to access the A49 to the southwest of Church Stretton. This access route bypasses the section of the A49 that falls within Flood Zones 2 and 3 so this route is accessible during all surface water and fluvial flooding events. The depths, velocities, hazards, durations and speeds of onset of surface water and fluvial flooding along access/ egress routes should be investigated further in a site-specific assessment, to confirm whether access for emergency vehicles could still be obtained.

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Climate Change	**Implications for the site**	• Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding. • There is no detailed fluvial modelling available at the site to indicate fluvial flood risk at the site due to climate change. As part of a site-specific Flood Risk Assessment, latest EA climate change allowances will need to be considered in a detailed hydraulic model, to confirm the impact in the site. • Climate change also needs to be considered for surface water events; at the site-specific stage, the 100-year +40% event is considered as part of surface water drainage strategies, or surface water modelling. • The current day 1,000-year surface water extent provides an indication of the likely increase in extent of the more frequent events. This would require a detailed FRA to assess the site layout and design. • Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.
Cumulative Impact of development within the catchment	**Level of risk**	**Catchment** / **Level of risk** Quinny Brook / High This development site covers 0.11% of the Quinny Brook catchment and lies at the upper end of the catchment. This catchment has been identified as one of those that is more sensitive to the cumulative impact of any development within the catchment. Communities within this catchment are at risk of surface water flooding in the 100-year event.
	Recommendations	It is estimated that 463m^3 of long-term storage would need to be compensated for at this site to maintain current greenfield runoff rates in addition to storage to capture the 100-year plus climate change event. Drainage compensation on the site should be developed to complement or enhance the proposed flood alleviation schemes immediately downstream of the site on The Bridleways. Refer to Section 9 of the main Level 2 SFRA for more information on cumulative impacts of development and policy recommendations in this catchment.

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Requirements for drainage control and impact mitigation	**Broad scale assessment of possible SuDS**	• Geology at the site consists of:
		  ○ Bedrock – Stretton Shale Formation - Mudstone.
		  ○ Superficial – Till - Diamicton.
		• The site is not located within any Environment Agency designated Source Protection Zone.
		• Most source control techniques are likely to be suitable. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater. Mapping also suggests that slopes may be unsuitable for selective source control techniques.
		• Mapping suggests that there is a medium 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.
		• Detention is unlikely to be feasible as mapping suggests mean site slopes are > 5%. Feasibility of such options should be assessed as part of a site-specific assessment. If this feature is feasible a liner maybe required to prevent the egress of groundwater.
		• Filtration is unlikely to be feasible as mapping suggests mean site slopes are > 5%. Feasibility of such options should be assessed as part of a site-specific assessment. If this feature is feasible it should be located where the depth to the water table is >1m, additionally a liner maybe required to prevent the egress of groundwater.
		• All forms of conveyance are likely to be suitable. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the egress of groundwater.
		• The site is not designated by the Environment Agency as previously being a landfill site.
		• Developers should refer to Shropshire Council's 'Surface Water Management: Interim Guidance for Developers' and 'SuDS requirements for new developments' webpage as well as the Level 1 SFRA, for information on suitable types of SuDS, the management train and opportunities and constraints in site master-planning.

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NPPF and planning implications	**Exception Test requirements**	The Local Authority have carried out the Sequential Test in line with national guidance. The Sequential Test will need to be passed before the Exception Test is applied. Residential development is classified as 'More Vulnerable'. It is recommendation 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. 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. • Highly Vulnerable infrastructure should not be permitted within FZ3a and FZ3b. • More Vulnerable and Less Vulnerable Infrastructure should not be permitted within FZ3b.

	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. • All sources of flooding, particularly the risk of surface water and groundwater flooding, should be considered as part of a site-specific flood risk assessment. • A more detailed hydraulic model may be required at Flood Risk Assessment stage, to confirm flood risk and ordinary watercourse flow paths, FZ3b and climate change extents, using channel topographic survey. • Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; Shropshire Council's Local Plan policies, and the LLFA's 'Surface Water Management: Interim Guidance for Developers' and 'SuDS requirements for new developments' webpage. • Consultation with the Local Authority, Local Lead Flood Authority and the Environment Agency should be undertaken at an early stage. • The development should be designed using a sequential approach. Development should be steered away from areas of fluvial flood risk and surface water flow routes, preserving these spaces as green infrastructure. Development must be in line with Table 3: flood risk vulnerability and flood zone compatibility of the NPPG. **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. • 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. • On site attenuation schemes would need to be tested against the unnamed watercourse to ensure flows are not exacerbated downstream within the catchment. • New or re-development should adopt exemplar source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. Assessment for runoff should include allowance for climate change effects. • 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. • Developers should refer to Shropshire Council's 'Surface Water Management: Interim Guidance for Developers' and 'SuDS requirements for new developments' webpage, and the Level 1 SFRA for information on SuDS. • New development must seek opportunities to reduce overall level of flood risk at the site, for example by: ○ Reducing volume and rate of runoff

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		○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space.
Key messages		The flood risk element of the Exception Test is likely to be passed if: • Development is limited to the 89% of the site outside of the Risk of Flooding from Surface Water zones and therefore should be steered towards the western side of the site. It should be noted that the surface water flood risk bisects the site and therefore consideration is needed regarding access to the north-eastern portion of the site. • 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). • Space for green infrastructure should be considered in the areas of highest flood risk. • This site lies within a catchment identified as high risk of cumulative impact of development. It is important to incorporate long-term storage capacity on this site to ensure current greenfield runoff rates are maintained. Refer to Section 9 in the main SFRA for specific policy recommendations related to this site and its wider catchment. Refer to the 'detailed guidance for developers' section (above) for further information on the measures that are appropriate for this site.

Mapping Information

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

Flood Zones	There is no Flood Zone data available at the site. The 2D modelling that delineates Flood Zones 2 and 3 covers watercourse catchments that exceed 3km^2. It is recommended that a more detailed hydraulic model is constructed at the site-specific Flood Risk Assessment stage, to confirm flood risk.
Climate change	Climate change was based on the 1,000-year surface water event to serve as an indication of the potential increase in the extent of the 100-year surface water event as a result of climate change. It is recommended that the latest EA's climate change allowances are modelled in a detailed hydraulic model as part of a site-specific Flood Risk Assessment.
Fluvial depth, velocity and hazard mapping	There is no available fluvial modelling data; therefore, the Risk of Flooding from Surface Water mapping has been used as this represents the floodplains of small watercourses. This should be explored further at site-specific stage.
Surface Water	The Risk of Flooding from Surface Water has been used to define areas at risk from surface water flooding.

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Surface water depth, velocity and hazard mapping		The surface water depth, velocity and hazard mapping for the 1 in 30-year (high risk), 1 in 100-year (medium risk) and 1 in 1,000-year (low risk) events is taken from the Environment Agency's Risk of Flooding from Surface Water mapping.