

Welwyn Hatfield Council Strategic Flood Risk Assessment Level 2 Detailed Site Summary Tables



Site details	Site Code	PB1			
	Address	Enfield Chase Estate			
	Area	148.76ha			
	Current land use	Greenfield			
	Proposed land use	Residential			
Sources of flood risk	Existing drainage features	The Turkey Brook flows through the middle of the site from the western part of the site and then along southern border. Multiple small drains feed into the Turkey Brook from the north, in the western part of the site.			
	Fluvial	Proportion of site at risk			
		FZ3b	FZ3a	FZ2	FZ1
		-%*	5%	6%	94%
		<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>			
		<p>Available data: This watercourse is represented in the EA's Flood Zones but there is no detailed or 2D generalised model available for this assessment. A detailed hydraulic model would be required at the site-specific assessment stage to confirm the flood risk along this watercourse. <i>*Flood Zone 3b is shown as indicative (FZ3a) on the mapping, as there is no modelling available for this site; therefore, flood risk to the site will need to be confirmed at the site-specific FRA stage.</i></p>			
	<p>Flood characteristics: Flooding is isolated along the Turkey Brook floodplain through the centre of the site, where the floodplain is more constrained to the west; however, the unnamed drains may also pose a fluvial flood risk but are not included in the Environment Agency's flood map for planning due to their catchment sizes. There is no modelled depth, velocity of hazard data available for this site. This is not to say there would be no risk, just there is no data available to assess at this stage. Detailed modelling at the site-specific FRA stage should be undertaken to confirm these risks to the site. Developers should steer away from developing in the vicinity of the channel and immediate floodplain, where risk will be highest.</p>				
	Surface Water	Proportion of site at risk (RoFfSW)			
		30-year	100-year	1,000-year	
		6%	8%	14%	
Max depths (m) (out of bank)					
0.3-0.6		0.6-0.9	>1.2		
Max velocity (m/s) (out of bank)					
0.5-1.0		1.0-2.0	>2.0		
Max hazard rating (out of bank)					
Danger for most	Danger for all	Danger for all			

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		<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 %). The % given are indicative only and more detailed work to refine this at a site-specific scale may be required.</i></p> <p>Description of surface water flow paths: Surface water flooding largely follows the topography of the Turkey Brook floodplain, with a few smaller 100 and 1,000-year flow paths draining into the Turkey Brook from surrounding drains. Around the area of Pond Wood there is a large impact from surface water flooding with the site here being affected by the 30-year extent. The surface water flood extents are larger than the EA's Flood Zones, filling more of the floodplain. Looking at the 100-year surface water event in the interactive mapping, velocities are predominantly low-medium (~0.5m), with an isolated reach of higher velocities adjacent to the Turkey Brook. The deepest area of the surface water extent is in the large area of ponding at Pond Wood (south of the channel) (0.6-0.9m). Hazard is predominantly 'Danger for most', but there are more isolated reaches of 'Danger for all' near the channel. Developers should steer development away from the Turkey Brook floodplain, particularly the south-eastern right-bank extent of the Turkey Brook, where risk is greatest.</p>		
	Reservoir	The site is not shown to be at risk of reservoir flooding from the available online maps.		
	Flood history	The Environment Agency's historic flood map shows no history of flooding at the site.		
Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition
		-	-	-
	This site is not protected by any formal flood defences.			
	Residual risk	-		
Emergency planning	Flood warning	The site is covered by the Environment Agency's Flood Warning Service via a Flood Alert Area, but not a Flood Warning Area.		
	Access and egress	<p>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.</p> <p>Dry access and egress is available to the north of the site via Coopers Lane Road in all fluvial and surface water flooding scenarios. Access needs to be considered in the south-western portion of the site, between the M25 and the Turkey Brook. Consideration may need to be given to the location of appropriate rest centre facilities, given the size of the site.</p>		

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Climate Change	Implications for the site	<ul style="list-style-type: none"> • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding. • Fluvial extents from climate change will increase from the current Flood Zones. There is currently no modelling data available, though it is likely the extents from the 70% climate change event will increase to similar to FZ2. The interactive mapping therefore shows an 'Indicative' climate change extent, which is Flood Zone 2. • Climate change impacts should be investigated at the site as part of a site-specific assessment, using detailed hydraulic modelling. • 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 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.

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Requirements for drainage control and impact mitigation	Broad scale assessment of possible SuDS	<ul style="list-style-type: none"> • Geology at the site consists of: <ul style="list-style-type: none"> ○ Bedrock – Thames Group – Clay, Gravel, Sand and Silt. ○ Superficial – Sand, gravel and no deposits in some areas • The site is not located within a Groundwater Source Protection Zone. • Source control techniques are likely to be suitable for this site. • Mapping suggest groundwater flooding may be a minor issue at the east of the site and no risk to the west. Infiltration techniques may be suitable however, site investigations should be carried out to assess potential for drainage by infiltration. • Detention features may be feasible providing site slopes are <5% at the location of the detention feature. If groundwater is a risk to the site, then a liner may be required to mitigate against potential contamination issues. • Filtration systems are probably suitable providing site slopes are <5% and the depth to the water table is >1m. If the site is at risk from groundwater, then a liner will be required. • All forms of conveyance features are likely to be suitable. Where slopes are >5%, features should follow contours or utilise check dams to slow flows. • The site is not designated by the Environment Agency as previously being a landfill site. • Developers should refer to Hertfordshire County Council's SuDS Design Guidance and SuDS Policy Statement, as well as the Level 1 SFRA, for information on suitable types of SuDS, the management train and opportunities and constraints in site master-planning.
NPPF and planning implications	Exception Test requirements	<p>The Local Authority have carried out the Sequential Test in line with national guidance. The Sequential and Exception Test document (November 2019) provides the detail on how this has been undertaken and can be found on the Local Authority website.</p> <p>The Sequential Test will need to be passed before the Exception Test is applied. Residential development is classified as 'More Vulnerable'.</p> <p>It is anticipated that proposed development will be sequentially located within Flood Zone 1.</p> <p>The Exception test will need to be applied if:</p> <ul style="list-style-type: none"> • 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.

	<p>Requirements and guidance for site-specific Flood Risk Assessment</p>	<p>Flood Risk Assessment:</p> <ul style="list-style-type: none"> • 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. • Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; Welwyn Hatfield Council's Local Plan policies, and the LLFA's SUDS guidance and Policy Statement. • 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. • 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. • Developers will need to confirm flood risk extents, depths, velocity and hazard at the site at the site-specific FRA stage using detailed hydraulic modelling of the Turkey Brook. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • 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 Turkey Brook 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 Hertfordshire County Council's SuDS Design Guidance, SuDS Policy Statement 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:
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		<ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ 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.
Mapping Information		
Flood Zones	Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning Flood Zones. Developers will need to confirm flood risk extents at the site at the site-specific FRA stage using detailed hydraulic modelling.	
Climate change	Climate change modelling was taken from Flood Zone 2 in the absence of available modelling. Developers will need to confirm climate change flood risk extents at the site at the site-specific FRA stage using detailed hydraulic modelling.	
Fluvial depth, velocity and hazard mapping	No mapping present for this site. Developers will need to confirm flood risk extents at the site at the site-specific FRA stage using detailed hydraulic modelling.	
Surface Water	The Risk of Flooding from Surface Water has been used to define areas at risk from surface water flooding. This dataset is not suitable for identifying whether an individual property will flood. It is based on the confidence in the modelling at that location; because of the way the mapping has been produced and is indicative, the maps are not appropriate to act as the 'sole evidence' for any specific planning or regulatory decision or assessment of risk in relation to flooding without further supporting studies or evidence. Please consult all layers and outputs provided on the RoFfSW mapping for further details.	
Surface water depth, velocity and hazard mapping	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.	