

SITE ASSESSMENT - 1-11 Elm Close

Address: Surbiton, KT5 9NA	Area: 0.38 Ha
	Site Reference: SA 125

Current Use	Proposed Use
Residential	Residential (C2)

Current Vulnerability Classification	Proposed Vulnerability Classification
More Vulnerable	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	83.5	% of Site	<25	0	% of Site
FZ3a	59.5	% of Site	25-50	100	% of Site
FZ3b	37	% of Site	50-75	0	% of Site
Surface Water			>75	0	% of Site
1 in 30	0	% of Site	Artificial		
1 in 100	0	% of Site	Reservoir	Y	At risk?
1 in 1000	78.9	% of Site	Canal	N	At risk?
Sewer Flooding			Town Centre		
No. Incidents	409		Y/N	N	

Flood Defences
The site is not in an area benefitting from flood defences.
Flood Warning Area
The EA Flood Warning Service is available at this site.

FLUVIAL / TIDAL

Risk Assessment (Defended) - Hogsmill				
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units
Speed of inundation	4.50	4.25	4.00	Hrs
Min. Depth	0.00	0.00	0.00	m
Max. Depth	0.96	1.49	2.02	m
Max. Velocity	0.42	0.42	0.90	m/s
Max Flood Level	15.89	16.42	16.71	m AOD
Max Ground Level	20.80	20.80	20.80	m AOD
Min Ground Level	14.95	14.95	14.95	m AOD
Max Flood Hazard	1.78	2.24	2.80	N/A
Duration of Flood	>22.5	>22.75	>23	Hrs

Description of Flood Mechanism
<ul style="list-style-type: none"> The site is at risk of flooding from the Hogsmill River which flows to the east of the site. The eastern half of the site is at risk of flooding in the 1 in 100 year flood event. Climate change is predicted to increase the flood extent, as well as the flood depth, hazard and velocity. In the undefended scenario, the flood extent for the 1 in 100 year flood event covers more than half of the site area, climate change also increases this extent slightly.

Site Access / Egress
Safe access and egress routes should be directed towards Tolworth Rise South to the northwest of the site where fluvial flooding is not predicted.

Mitigation / FRA Requirements
<ul style="list-style-type: none"> Only water compatible or essential uses (subject to the Exception Test) are permitted in FZ3b (the eastern section of the site). There can be no increase in residential units in FZ3b. Development in this area which is located above the design flood level is still designated as functional floodplain. Self-contained basement dwellings and bedrooms are not permitted in FZ2 (the majority of the site). A FRA must be submitted as part of a planning application. Include appropriate flood resistance or resilience measures to address predicted flood depths. See SFRA Level 2 Report mitigation requirement numbers 4.2, 4.4, 4.5 and 4.6 for further development stipulations. Develop a Flood Emergency and Evacuation Plan for the site. Site users should be signed up to EA's Flood Warning Service.

* The +35% Climate Change Allowance event (upper end allowance extreme case) is reviewed

Risk Assessment (Undefended)			
Parameter	FZ3a	*FZ3a+CC	Units
Speed of inundation	N/D	N/D	Hrs
Min. Depth	N/D	N/D	m
Max. Depth	N/D	N/D	m
Max. Velocity	N/D	N/D	m/s
Max. Hazard	N/D	N/D	N/A
Duration of Flood	N/D	N/D	Hrs

Figure 1 - Fluvial Flood Depth Map

Figure 2 - Fluvial Flood Hazard Map

SURFACE WATER

Risk Assessment				
Parameter	1 in 30	1 in 100	1 in 1000	Units
Min. Depth	0	0	0.00-0.15	m
Max. Depth	0	0	> 1.20	m
Max. Velocity	0	0	1.00-2.00	m/s
Max. Hazard	0	0	1.25-2.00	N/A

Site Access / Egress
Safe egress routes should be directed to the northwest of the site towards Tolworth Rise South where there is a lower risk of flooding.

Mitigation - Flood Risk Requirements
<ul style="list-style-type: none"> Development should be directed away from the eastern half of the site where there is higher risk of surface water flooding. See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.4, 4.5 and 4.6 for further development stipulations.

Mitigation - Surface Water Drainage
<ul style="list-style-type: none"> A Kingston SuDS Proforma must be submitted with the planning application. Developments should apply the Sustainable Drainage Hierarchy set out in Policy SI13 of the London Plan. Ground investigations are required to confirm whether infiltration based SuDS are suitable.

*The 1 in 1000 annual probability extent represents the potential climate change adjusted impact of current risk

Description of Flood Mechanism
<ul style="list-style-type: none"> The site is at risk of surface water flooding for the 1 in 1000 year event, particularly on the eastern half of the site. Elm Close to the south of the site and Tolworth Rise South to the north are at risk of surface water flooding in the 1 in 1000 year event. Climate change is predicted to increase the flood extent, depth, velocity, and hazard.

Figure 3 - RoFSW Flood Depth Map

Figure 4 - RoFSW Flood Hazard Map



SITE ASSESSMENT - 1-11 Elm Close		
SEWER	GROUNDWATER	ARTIFICIAL
Risk Assessment	Risk Assessment	Risk Assessment
<ul style="list-style-type: none"> The site falls within a postcode area where there are 409 reported flood incidents from sewer flooding. The site is served by separate surface water and foul sewer networks. 	<ul style="list-style-type: none"> The site is classified as having $\geq 25\%$ $< 50\%$ susceptibility to groundwater flooding. The site is underlain by London Clay bedrock geology. 	<ul style="list-style-type: none"> This site is at risk of flooding from the Epsom Common Great Pond reservoir. The reservoir extent map predicts that if this reservoir breaches on a wet day, the eastern section of the site will be at risk of flooding.
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Map	Figure 7 - Outline Reservoir Flood Map
Mitigation Requirements	Mitigation Requirements	Mitigation Requirements
<ul style="list-style-type: none"> Applicant must consult with TWUL to confirm if the development site has historically flooded. TWUL must agree to any proposed sewer connections. Where historic flooding has occurred, the applicant must show how this risk will be managed for the lifetime of the development. 	<ul style="list-style-type: none"> Applicant should carry out a screening study (as a minimum) to establish if there are any subterranean flood risk issues that may require further investigation. If there is a potential level of impact, mitigation actions must be proposed. Must be prepared by a chartered professional or specialist. 	<ul style="list-style-type: none"> Propose appropriate and proportionate risk management measures. A suitable emergency response plan should be put in place, including an emergency warning system in the event of a reservoir flooding incident. Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan.
PLANNING CONSIDERATIONS		
Safety of Development		
<p>A. Can the development be future proofed for climate change considerations?</p> <ul style="list-style-type: none"> Yes. See SFRA - Level 2 Report mitigation requirement numbers 4.2 and 4.4 for the required finished floor levels and flood resistant / resilient building stipulations. <p>B. Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?</p> <ul style="list-style-type: none"> Yes - The development must use surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and / or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological / biodiversity benefits as per London Plan Policy SI 13. See SFRA - Level 2 Report mitigation requirement number 4.5 for compensatory flood storage stipulations, and number 4.6 for voids mitigation specification. <p>C. What is the cumulative impact of the development land use change and will flood risk increase?</p> <ul style="list-style-type: none"> The development land use will remain residential, however will change to C2 class. The vulnerability classification remains the same. The site is currently partially impermeable, but there is a large amount of green space. An increase in impermeable area coverage on site will increase surface water runoff and flood risk if not managed properly. <p>D. How can the development reduce risk overall?</p> <ul style="list-style-type: none"> Direct development away from the eastern half of the site. Include SuDS to manage surface water runoff and reduce run-off rates to comply with Policy DM 4 in Kingston's Core Strategy. Safe egress routes should be directed towards the western section of the site where there is lower risk of flooding. By complying with SFRA - Level 2 Report mitigation requirement numbers 4.2, 4.4, 4.5 and 4.6. <p>E. Will development require a flood risk permit/watercourse consent?</p> <ul style="list-style-type: none"> No. The site is not within 8m of a Main River or 5m of an Ordinary Watercourse. <p>F. Is the Exception Test required?</p> <ul style="list-style-type: none"> No development is permitted in the eastern area of the site in Flood Zone 3b. There can be no increase in residential units in FZ3b. The Exception Test is required for 'More Vulnerable' development in Flood Zone 3a (the middle and eastern section of the site). This can be passed by making the site safe throughout its lifetime without increasing flood risk elsewhere (see questions A, B, and C). The site could also reduce flood risk overall with appropriate SuDS and flood storage compensation measures implemented (see Mitigation - Surface Water Drainage and Mitigation - Flood Risk Requirements boxes). <p>F. What are the delivery challenges in developing at this site in terms of passing the Exception Test?</p> <ul style="list-style-type: none"> Given the high flood level expected on the site, significant floodplain compensation and voids will be required. Due to the high flood levels predicted for the 1 in 100 year + CC event, achieving the required finished floor levels may not be feasible (see SFRA requirement 4.3). The site should be explored further to determine whether the proposed use can be delivered on site, given the constraint of functional floodplain which covers 37% of the site. 		



