Enderby Place

Summary Information	
Site Reference	P2-GP1
Address	Enderby Place, Telegraph Avenue. North of SE10 0TE
Area (ha)	1.24
Current Use	Vacant.
Current Vulnerability	Less Vulnerable
Proposed Use	Residential and industrial/commercial use.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	0	% of site	Limited potential for flooding to occur	N/A	% of site
FZ3a	100.00	% of site	Potential for flooding of properties below ground level	N/A	% of site
FZ3b	0.01	% of site	Potential for flooding to occur at surface	N/A	% of site
Surface Water			Sewer Flooding		
High	3.84	% of site	Number of incidents within the predominant postcode	20 - 30	
Medium	7.31	% of site	Is the site located within the Thamesmead area?	No	
Low	31.56	% of site			
Flood Defences			Flood Warning Area		
The site is at risk of flooding from rivers taking into account the presence and condition of flood defences according to the EA's RoFRS layer. There are flood defences along the western boundary of the site.			The EA Flood Warning Service is available at this site.		

See webmap supporting assessment: Greenwich - Level 1 and 2 SFRA

1.1 Tidal

Description of Flood Mechanism
• The site is at risk of breach flooding from the River Thames which is located immediately adjacent to the west of the site. • During both the 2005 and 2100 Thames Upriver modelled events, the site is entirely inundated. • During both the 1 in 200 year (2115) and 1 in 1000 year (2115) Thames Downriver modelled events, the site is largely inundated with the exception of some of the western area of the site.
Mitigation / FRA Requirements
• 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 4.3, 4.4 and 4.5, Policies E2 and E3 of the existing Greenwich Local Plan, and Policy EN6 of the draft Local Plan for further development stipulations. • Site users should be signed up to the EA's Flood Alert and Flood Warning Service. • The development should allow for safe, dry access to high ground as the extent of inundation covers the majority of the site. • Future defence raisings may be required in line with the TE2100 Plan crest levels guidance. They must consider the lifetime of the development and the status of current flood defence crest levels in the site-specific FRA. • Sea Level Allowances, provided by the EA, should be considered to inform flood resilient construction and design measures.
Climate Change Considerations
Although the site is impacted by both the Thames Breach Upriver and Downriver modelled events, as the Upriver model indicates higher depths, this model has been asessed. Developers will need to consider both models. During the Thames Breach Upriver modelled events, climate change is not expected to change the extent of tidal flood risk onsite. The maximum depth increases from 2.31m to 3.02m, the maximum velocity increases from 4.31m/s to 5.33m/s, the maximum flood level increaes from 4.48mAOD to 5.04mAOD and the maximum hazard increases from 6.58 to 8.58.

Risk Assessment (Tidal – Thames Breach Upriver 2017)			
Parameter	2005	2100	Units
Max. Depth	2.31	3.02	m
Max. Velocity	4.31	5.33	m/s

Max Flood Level	4.48	5.04	m AOD
Max Ground Level	6.25	6.25	m AOD
Min Ground Level	1.55	1.55	m AOD
Max Flood Hazard	6.58	8.58	N/A

1.2 Surface Water

Description of Flood Mechanism	
Surface water flood risk is concentrated around the access road (Telcon Way) and in the eastern section where the existing building is located. These areas include areas of high risk.	
Mitigation – Flood Risk Requirements	**Mitigation – Surface Water Drainage**
Development should be directed away from eastern and northern areas of the site, and towards the western and southern areas of the site. Development should comply with SFRA - Level 2 Report Section 4 mitigation requirement numbers 4.3 and 4.9.	See SFRA Level 2 Report mitigation requirement 5.0 for further development stipulations. Developments should apply the Sustainable Drainage Hierarchy set out in Policy SI 13 of the London Plan as well as Policy E2 of the existing Greenwich Local Plan and Policy EN6 of the draft Local Plan. Ground investigations are required to confirm whether infiltration SuDS are suitable.
Climate Change Considerations	
During the high risk events, the extent along the access road slightly extends further onto the access road, the extent in the eastern main area of the site extends slightly westward, with a new area of high risk forming in the northern main area of the site. The maximum depth increases from 0.2m to 0.3m, whilst the maximum velocity and hazard remain unchanged. During the medium risk events, the extent along the access road extends further onto the access road, and the extents in the main area of the site slightly extend northward and eastward. The maximum depth and hazard remain unchanged, whilst the maximum velocity increases from 0.5ms to 1.0m/s. During the low risk events, the extents extend to cover the majority of the access road and the eastern main area of the site. The maximum depth increases from 0.3m to 1.2m and the maximum hazard increases from 1.25 to 2.0, whilst the maximum velocity remains unchanged.	

Risk Assessment				
Parameter	High	Medium	Low	Units
Max. Depth	0.2	0.3	0.3	m
Max. Velocity	0.5	0.5	1.0	m/s
Max. Hazard	0.75	0.75	1.25	N/A

Risk Assessment – with Climate Change				
Parameter	High	Medium	Low	Units
Max. Depth	0.3	0.3	1.2	m
Max. Velocity	0.5	1.0	1.0	m/s
Max. Hazard	0.75	0.75	2.0	N/A

1.3 Sewer

Risk Assessment	Mitigation Requirements
The site falls within a postcode area where there are 20 - 30 reported flood incidents from sewer flooding. The site is assumed to be served by surface water and sewer networks, given their proximity to the site.	The applicant must consult with TWUL to confirm if the development site has historically flooded. TWUL must agree to any proposed sewer connections. If historic flooding has occurred, the applicant must demonstrate how this risk will be managed throughout the development's lifetime.

1.4 Groundwater

Risk Assessment	Mitigation Requirements
There is no information regarding the risk of groundwater flooding onsite. The site is underlain by Woolwich and Reading Beds bedrock geology. The superficial geology is Alluvium.	For new developments that involve groundworks, especially if basements are planned, the 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. This must be prepared by a chartered professional or specialist.

1.5 Artificial

Risk Assessment	Mitigation Requirements
This site is at risk of flooding from the Banbury, High Maynard, King George V, Lockwood, Queen Elizabeth II, William Girling and Wraysbury reservoirs. The reservoir extent map predicts that if any of these reservoirs breach on a wet day, the site will be at risk of flooding.	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.

1.6 Planning Considerations – Safety of Development

A.	Can the development be future proofed for climate change considerations?
	• During the Thames Breach Upriver modelled events, the site is entirely inundated. Climate change is expected to increase the maximum depth, velocity, flood level and hazard. • Surface water flood risk extent is expected to increase during all events due to climate change. • See SFRA - Level 2 Report Section 4 mitigation requirement number 4.4 for the required flood resistant / resilient building stipulations.
B.	Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?
	• 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 numbers 4.1, 4.3, 4.5, 4.7, 4.8, 4.9 and 5.0 and Policies E2, E3 of the Greenwich Local Plan and Policy EN6 of the draft Local Plan for further development stipulations.
C.	What is the cumulative impact of the development land use change and will flood risk increase?
	• The development land use is changing from 'Less Vulnerable' to 'More Vulnerable'. • The site largely impermeable with permeable areas along both sides of the access road, along the northern site boundary and in the westernmost area of the site. • Development must mitigate any increase in impermeable area to the site with flood plain compensation and runoff storage to prevent any increase in flood risk.

An increase in impermeable area coverage on site will increase surface water runoff and flood risk if not managed properly.
D. How can the development reduce risk overall?
• Only water compatible or essential uses (subject to the Exception Test) are permitted in FZ3b to the very northeast of the site. • Development should be directed toward the western and southern areas of the site where there is less risk of surface water flooding. • By complying with Policy E2 of the Greenwich Local Plan and Policy EN6 of the draft Local Plan through demonstrating that the development will avoid or minimise all sources of flood risk to people and property taking climate change into account, and incorporating SuDS measures in order to manage surface water runoff as close to its source as possible and to meet the required SuDS performance standards. • By complying with SFRA - Level 2 Report Section 4 mitigation requirement 4.4.
E. Which safe access and egress routes are recommended?
• Safe access and egress routes should be directed towards Tunnel Avenue where there is less risk of surace water flooding. • Given the risk of tidal flooding in a breach scenario to the available access and egress routes, the applicant should provide a Flood Risk Emergency Plan in line with Adept guidance.
F. Will development require a flood risk permit / watercourse consent?
Yes, the site is within 8m of a main river and within 16m of a tidal river.
G. Can the site pass the Exception Test?
• A small area of the site is located within Flood Zone 3b, therefore ‘More Vulnerable’ development is not permitted in the area within this Flood Zone. • The site is located within Flood Zone 3a and the proposed vulnerability classification is ‘More Vulnerable’, therefore the Exception Test is required.