

Thamesmead Waterfront

Summary Information	
Site Reference	P5-TA4
Address	Thamesmead Waterfront, SE28
Area (ha)	97
Current Use	Residential. Town Centre; primarily large floorplate retail with extensive parking, leisure centre, library. Vacant land, including a former landfill site. Open Space, some publicly accessible.
Current Vulnerability	More Vulnerable
Proposed Use	Mixed-use development including residential, town centre uses, commercial, community and transport uses, green and blue infrastructure.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	2.55	% of site	Limited potential for flooding to occur	98.92	% of site
FZ3a	44.61	% of site	Potential for flooding of properties below ground level	1.08	% of site
FZ3b	12.98	% of site	Potential for flooding to occur at surface	0.00	% of site
Surface Water			Sewer Flooding		
High	0.62	% of site	Number of incidents within the predominant postcode	10 - 20	
Medium	2.10	% of site	Is the site located within the Thamesmead area?	Yes	
Low	10.07	% 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 is a flood defence located along northern boundary of the site alongside the River Thames, and in the northeastern area of the site around Thamesmere (Lake Four) and along the canal and waterway.			The EA Flood Warning Service is available at this site.		



See webmap supporting assessment: [Greenwich - Level 1 and 2 SFRA](#)

1.1 Fluvial

Description of Flood Mechanism
- The site is at risk of fluvial flooding from the Marsh Dykes fluvial model, which includes waterways and lakes located within the eastern area of the site. - During the 1 in 30 year event, fluvial flood risk is concentrated in the eastern areas of the site around the lakes and waterways which does encroach on some of the existing development. During the 1 in 100 year and 1 in 100 year plus 20% climate change events, there is no change to the flood risk extent.
Mitigation / FRA Requirements
- Only water compatible or essential uses (subject to the Exception Test) are permitted in FZ3b in the eastern areas of the site around the lakes and waterways and along the northern boundary. - Self-contained basement dwellings and bedrooms are not permitted in FZ3a in the eastern, southern and some of the central areas of the site, and along the northern boundary. See SFRA Level 2 Report mitigation requirement numbers 4.7 and 4.8 for additional basement stipulations. - 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 4.1, 4.2, 4.3, 4.5 and 4.9 for further development stipulations. - Develop a Flood Risk Emergency Plan for the site. - Site users should be signed up to the EA's Flood Warning Service. - Due to the lack of 2D data onsite for fluvial flood risk only, the 04-001-1 node has been assessed which is one of the most central nodes located within the site, to provide an indication of the maximum velocity and flood level impacting the site. - Developers will need to determine the 1 in 100 year plus climate change flood level and depths based on the most relevant development scenario provided in the Marsh Dykes 2020 Modelling Report. - As no baseline 1 in 100 year plus climate change modelled event was provided, the 1 in 1000 year modelled event has been assessed to determine a climate change influence.
Climate Change Considerations
For the fluvial only Marsh Dykes extents, there is no change to the extent with a 20% climate change scenario applied to the 1 in 100 year event. The maximum flood level increases from 0.47 mAOD to 0.76 mAOD and the maximum velocity increases from 0.66m/s to 1.23m/s.



Risk Assessment (Fluvial)				
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units
Max. Velocity	0.16	0.66	1.23	m/s
Max Flood Level	-0.29	0.47	0.76	m AOD
Max Ground Level	24.61	24.61	24.61	m AOD
Min Ground Level	-1.41	-1.41	-1.41	m AOD

* The 1 in 1000 year critical duration event level was used to assess climate change and an assumption has been made on the parameter based on the provided figures

1.2 Tidal

Description of Flood Mechanism
- The site is at risk of tidal breach flooding from the River Thames, which flows alongside the northern boundary of the site. - During the 1 in 200 year (2005) Thames Downriver modelled event, tidal flood risk is concentrated in the eastern and southern sections of the site, however also includes some smaller areas in the western section of the site. - During the 1 in 1000 year (2005) Thames Downriver modelled event, tidal flood risk extends from the 1 in 200 year (2005) event across some additional western areas of the site. - During the 1 in 200 (2115) Thames Downriver modelled event, tidal flood risk is concentrated in the eastern and southern sections of the site, and in the western section includes areas along the northern boundary and a corridor from east to west. - During the 1 in 1000 (2115) Thames Downriver modelled event, tidal flood risk extends from the 1 in 200 year (2115) event to cover the majority of the northern boundary in the western section, which also extends further into the western section 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 and 4.4, 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 a significant area 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

During the 1 in 200 year events, climate change increases the extent further in the western section of the site, along the northern boundary, extending further from the east, and forming a corridor from east to west. The maximum depth increases from 5.31m to 5.65m, the maximum velocity increases from 5.89m/s to 6.29m/s, the maximum flood level increases from 5.81mAOD to 6.82mAOD and the maximum hazard increases from 19.56 to 22.86.

During the 1 in 1000 year events, climate change increases the extent further in the western section of the site, along the northern boundary which also extends into more central areas, and around the corridor from east to west. The maximum depth increases from 5.43m to 5.90m, the maximum velocity increases from 6.22m/s to 6.53m/s, the maximum flood level increases from 6.23mAOD to 7.15mAOD and the maximum hazard increases from 20.78 to 23.93.

Risk Assessment (Tidal – Thames Breach Downriver 2018)

Parameter	2005_0200	2005_1000	2115_0200	2115_1000	Units
Max. Depth	5.31	5.43	5.65	5.90	m
Max. Velocity	5.89	6.22	6.29	6.53	m/s
Max Flood Level	5.81	6.23	6.82	7.15	m AOD
Max Ground Level	24.61	24.61	24.61	24.61	m AOD
Min Ground Level	-1.41	-1.41	-1.41	-1.41	m AOD
Max Flood Hazard	19.56	20.78	22.86	23.93	N/A



1.3 Surface Water

Description of Flood Mechanism	
The western area of the site has predominantly localised areas of surface water flood risk, including some areas of high risk. The lakes are at low risk, however the waterways have high, medium and low risk areas. The existing development predominantly has surface water risk concentrated in the centre but also within some localised areas. High risk areas are predominantly located within some of the central car parks, and east and west of the waterway running through the centre.	
Mitigation – Flood Risk Requirements	Mitigation – Surface Water Drainage
Development should be directed away from high risk areas across the site, particularly those in the existing developed area. Development can be directed towards the western and central areas of the site, and the areas in the eastern section that are at limited risk of surface water flooding. 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 high risk events, the flood extent expands over the existing high risk areas, with some new areas of localised risk, and particularly within the existing developed area in the eastern part of the site. However, maximum flood depth, velocity and hazard remain unchanged. During medium risk events, the flood extent again increases beyond the existing medium risk areas, with some new areas of localised risk, and with the greatest spread occurring in the existing developed area in the eastern part of the site including some of the waterways and ponds. Maximum flood depth increases from 0.6m to 0.9m, and maximum velocity increases to 1.0m/s from 0.5m/s, while hazard remains unchanged. During low risk events, the flood extent further expands over the existing low risk areas, with some new localised areas across the site, particularly in the western section of the site and in the existing developed area in the eastern section of the site. Maximum depth and velocity remain unchanged, while maximum hazard increases from 1.25 to 2.0.	



Risk Assessment				
Parameter	High	Medium	Low	Units
Max. Depth	0.6	0.6	1.2	m
Max. Velocity	0.5	0.5	1.0	m/s
Max. Hazard	1.25	1.25	1.25	N/A

Risk Assessment – with Climate Change				
Parameter	High	Medium	Low	Units
Max. Depth	0.6	0.9	1.2	m
Max. Velocity	0.5	1.0	1.0	m/s
Max. Hazard	1.25	1.25	2.0	N/A

1.4 Sewer

Risk Assessment	Mitigation Requirements
The site falls within a postcode area where there are 10 - 20 reported flood incidents from sewer flooding. The site is assumed to be served by separate surface water and foul 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. New developments should avoid connecting to the existing surface water drainage system within the Thamesmead catchment area, as it is currently at capacity. New developments that propose to utilise existing connections into existing surface water drainage systems will be required to discharge at greenfield rates.



1.5 Groundwater

Risk Assessment	Mitigation Requirements
The site predominantly has limited potential for flooding to occur. There are small areas within the centre of the site and on the northwestern boundary that have potential for groundwater flooding of property situated below ground level. The site is underlain by the Thanet Sand Formation bedrock geology along the southern section of the site, and White Chalk Subgroup across the central and northwestern sections of the site. There is no information available for the bedrock geology in the northeastern section of the site. In the southern part of the site, the superficial deposits are Alluvium. There is no information regarding the superficial deposits for the northern sections of the site.	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.

1.6 Artificial

Risk Assessment	Mitigation Requirements
This site is at risk of flooding from the Banbury, King George V, and William Girling reservoirs on a dry day. On a wet day, the site is at risk of flooding from the Queen Mary, Wraysbury, Banbury, King George V, Lockwood, and William Girling reservoirs. The reservoir extent map predicts that if any of these reservoirs breach on the respective dry or 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.



1.7 Planning Considerations – Safety of Development

A.	Can the development be future proofed for climate change considerations?
	- The risk of surface water flooding in the climate change scenario indicates that climate change is projected to increase the extent of surface water flooding across the site. The maximum depth and velocity increases in the medium risk event, and the maximum hazard increases in the low risk event. - The extent of fluvial flooding from the Marsh Dykes model does not change due to climate change, however the maximum flood level and velocity are expected to increase. - In the Thames Tidal Breach Downriver modelled scenarios, there is an increase in extent due to climate change. The maximum depth, velocity, flood level and hazard increase in a climate change scenario. - 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, 4.2, 4.3, 4.5, 4.7, 4.8 and 4.9 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 not changing from 'More Vulnerable'. - The site is predominantly permeable for much of the site, other than the town centre area and the footpaths which traverse 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 the site will increase surface water runoff and flood risk if not managed properly.
D.	How can the development reduce risk overall?
	- Development should be directed towards the western and central areas of the site, and areas in the eastern section of the site that are at limited risk of surface water and fluvial 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 for the western section of the site should be directed towards Hill View Drive where there is less risk of surface water flooding. For the town centre area, safe access and egress should be directed onto Central Way from Twin Trumps Way. • Given the risk of tidal flooding 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 16m of a Tidal River and 8m of a Main River.
G. Can the site pass the Exception Test?
• Part 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.

