

Gunnery Terrace

Summary Information	
Site Reference	P4-W18
Address	Land at Gunnery Terrace SE18
Area (ha)	0.94
Current Use	Gunnery Terrace comprises a mix of office, industrial and other uses.
Current Vulnerability	Less Vulnerable
Proposed Use	Residential-led mix-use.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	14.87	% of site	Limited potential for flooding to occur	0.00	% of site
FZ3a	70.86	% of site	Potential for flooding of properties below ground level	100	% of site
FZ3b	0.00	% of site	Potential for flooding to occur at surface	0.00	% of site
Surface Water			Sewer Flooding		
High	15.78	% of site	Number of incidents within the predominant postcode	30-40	
Medium	17.09	% of site	Is the site located within the Thamesmead area?	No	
Low	35.39	% 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.			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 tidal flooding from the River Thames which is located approximately 320m north of the site at its closest point. - During the 1 in 200 year (2005) Thames Downriver modelled event, tidal flood risk is concentrated in the northern area of the site and along the eastern and western boundaries. - During the 1 in 1000 year (2005) Thames Downriver modelled event, tidal flood risk is concentrated in the northern area of the site, along the eastern and western boundaries, and across an area in the southern area of the site. - During the 1 in 200 year (2115) Thames Downriver modelled event, tidal flood risk covers the majority of the site excluding an area along the southern boundary. - During the 1 in 1000 year (2115) Thames Downriver modelled event, the 1 in 200 (2115) modelled event extends slightly further south but does not fully inundate 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. - Sea Level Allowances, provided by the EA, should be considered to inform flood resilient construction and design measures. - Site users should be signed up to the EA's Flood Alert and Flood Warning Service.
Climate Change Considerations
During the Thames Breach Downriver 1 in 200 year event, climate change is expected to increase the extent of tidal flood risk to cover almost the entire site, excluding an area along the southern boundary. The maximum depth increases from 0.76m to 1.23m, the maximum velocity increases from 0.52m/s to 0.63m/s, the maximum flood level increases from 5.49mAOD to 6.00mAOD and the maximum hazard increases from 1.43 to 2.09. During the Thames Breach Downriver 1 in 1000 year event, climate change is also expected to increase the extent of tidal flood risk to cover the majority of the site apart from the southern boundary. The maximum depth increases from 0.98m to 1.36m, the maximum velocity increases from 0.54m/s to 0.69m/s, the maximum flood level increases from 5.71mAOD to 6.15mAOD and the maximum hazard increases from 1.65 to 2.33.



Risk Assessment (Tidal – Thames Breach Downriver 2018)					
Parameter	2005_0200	2005_1000	2115_0200	2115_1000	Units
Max. Depth	0.76	0.98	1.23	1.36	m
Max. Velocity	0.52	0.54	0.63	0.69	m/s
Max Flood Level	5.49	5.71	6.00	6.15	m AOD
Max Ground Level	6.55	6.55	6.55	6.55	m AOD
Min Ground Level	4.71	4.71	4.71	4.71	m AOD
Max Flood Hazard	1.43	1.65	2.09	2.33	N/A

1.2 Surface Water

Description of Flood Mechanism	
Surface water flood risk is primarily concentrated in the centre of the site, along the western boundary, and in the northern section of the site. Areas of high risk are located in the centre of the site and along the western boundary.	
Mitigation – Flood Risk Requirements	Mitigation – Surface Water Drainage
Development should be directed away from the centre and western boundary of the site and towards the eastern, southern and northern areas of the site where there is no high risk present. 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 increases slightly in the northeastern corner, in the centre of the site and along the western boundary. The maximum depth increases from <0.2m to 0.2m. The maximum velocity and hazard remain unchanged. During the medium risk events, a new extent appears along the northern boundary of the site and the extents also increase slightly in the northeastern corner, in the centre of the site and along the western boundary. The maximum depth increases from 0.2m to 0.3m. The maximum velocity increases from 0 m/s to 0.5m/s. The maximum hazard increases from 0.5 to 0.75.	



During the low risk events, the extent increases predominantly in the western area of the site, and in an area in the eastern section of the site. The maximum depth, velocity and hazard remain unchanged.

Risk Assessment				
Parameter	High	Medium	Low	Units
Max. Depth	<0.2	0.2	0.3	m
Max. Velocity	0.25	0.0	1.0	m/s
Max. Hazard	0.5	0.5	1.25	N/A

Risk Assessment – with Climate Change				
Parameter	High	Medium	Low	Units
Max. Depth	0.2	0.3	0.3	m
Max. Velocity	0.25	0.5	1.0	m/s
Max. Hazard	0.5	0.75	1.25	N/A

1.3 Sewer

Risk Assessment	Mitigation Requirements
The site falls within a postcode area where there are 30 - 40 reported flood incidents from sewer flooding. The site is assumed to be served by separate surface water, combined 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.

1.4 Groundwater

Risk Assessment	Mitigation Requirements
The site has potential for groundwater flooding of property situated below ground level. The site is underlain by the Thanet Sand Formation bedrock geology and has superficial deposits comprised of Alluvium across the majority 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.
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1.5 Artificial

Risk Assessment	Mitigation Requirements
This site is at risk of flooding from the Lockwood reservoir. The reservoir extent map predicts that if this reservoir breaches 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?
	- The risk of surface water flooding climate change scenario indicates that climate change impacts are projected to increase the extent of surface water flooding across the site. The maximum depth increases in a high risk event, and the maximum depth, velocity and hazard increase in a medium risk event. - Climate change is expected to increase the extent of tidal flood risk to inundate most of the site in the Downriver modelled scenarios, other than the area along the southern border of the site. 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 4.2, 4.3, 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 is currently predominantly impermeable, with some small permeable areas, predominantly located along the northern boundary of the site. • Development must mitigate any increase in impermeable area to the site with 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?
• Development should be directed towards the eastern, southern and northern 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 requirements 4.2 and 4.4.
E. Which safe access and egress routes are recommended?
Given the risk of tidal and surface water 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?
No, the site is not within 16m of a Tidal River, 8m of a Main River or 5m of an Ordinary Watercourse.
G. Can the site pass the Exception Test?
The site is located within Flood Zone 3a and the proposed vulnerability classification is 'More Vulnerable', therefore the Exception Test is required.

