

Gallions Reach Health Centre

Summary Information	
Site Reference	P5-TA5
Address	Gallions Reach Health Centre, Bentham Road, London SE28 8BE
Area (ha)	1.4
Current Use	Health Centre.
Current Vulnerability	More Vulnerable
Proposed Use	Residential or health and residential use.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	0.00	% of site	Limited potential for flooding to occur	100	% of site
FZ3a	100	% of site	Potential for flooding of properties below ground level	0.00	% of site
FZ3b	10.74	% of site	Potential for flooding to occur at surface	0.00	% of site
Surface Water			Sewer Flooding		
High	2.19	% of site	Number of incidents within the predominant postcode	No data	
Medium	12.13	% of site	Is the site located within the Thamesmead area?	Yes	
Low	33.36	% 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 the southern and western boundaries 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 Fluvial

Description of Flood Mechanism
- The site is at risk from fluvial flooding from the Marsh Dykes fluvial model. The waterway is located around the southern and western borders of the site. - During the 1 in 30 year event, fluvial flood risk is concentrated along the southern and western edges of the site. During the 1 in 100 year event, fluvial flood risk also covers the southern and western edges, and several areas in the northern and eastern sections of the site. During the 1 in 100 year event (plus 20% climate change), the extent is similar to the 1 in 30 year event, however extends slightly further north from the southern edges.
Mitigation / FRA Requirements
- Only water-compatible or essential uses (subject to the Exception Test) are permitted in FZ3b (western and southern edges of the site). - Self-contained basement dwellings and bedrooms are not permitted in FZ3a. 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 04-005 node has been assessed which is the closest node to the site located slightly to the west, 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 a decrease in the extent with a 20% climate change scenario applied to the 1 in 100 year event, which no longer covers some of the areas across the northern and eastern sections of the site. Climate change is however expected to increase the maximum flood level from 0.46mAOD to 0.73mAOD and the maximum velocity from 0.29m/s to 0.30m/s.



Risk Assessment (Fluvial)				
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units
Max. Velocity	0.06	0.29	0.30	m/s
Max Flood Level	-0.29	0.46	0.73	m AOD
Max Ground Level	2.28	2.28	2.28	m AOD
Min Ground Level	-0.37	-0.37	-0.37	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 is located approximately 375m north from the northern boundary of the site. During the 1 in 200 year and 1 in 1000 year (2005) and 1 in 200 and 1 in 1000 (2115) Thames Downriver modelled events, the entire site is inundated.
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 the entire site. • Sea Level Allowances, provided by the EA, should be considered to inform flood resilient construction and design measures.
Climate Change Considerations
During the Thames Breach Downriver 1 in 200 year events, climate change is not expected to increase the extent as site is already fully inundated. The maximum depth increases from 3.85m to 4.80m, the maximum velocity increases from 1.65m/s to 1.83m/s, the maximum hazard increases from 6.09 to 7.16 and the maximum flood level increases from 3.70mAOD to 4.59mAOD. During the Thames Breach Downriver 1 in 1000 year events, climate change is not expected to increase the extent as site is already fully inundated. The maximum depth increases from 3.98m to 5.10m, the maximum velocity increases from 1.73m/s to 1.92m/s, the maximum hazard increases from 6.46 to 7.52 and the maximum flood level increases from 3.80mAOD to 4.90mAOD.



Risk Assessment (Tidal – Thames Breach Downriver 2018)					
Parameter	2005_0200	2005_1000	2115_0200	2115_1000	Units
Max. Depth	3.85	3.98	4.80	5.10	m
Max. Velocity	1.65	1.73	1.83	1.92	m/s
Max Flood Level	3.70	3.80	4.59	4.90	m AOD
Max Ground Level	2.28	2.28	2.28	2.28	m AOD
Min Ground Level	-0.37	-0.37	-0.37	-0.37	m AOD
Max Flood Hazard	6.09	6.46	7.16	7.52	N/A

1.3 Surface Water

Description of Flood Mechanism	
Surface water flood risk is predominantly located in the eastern and northern sections of the site around the existing roadways and car park. There are two small main areas of high risk in the northeastern area of the site.	
Mitigation – Flood Risk Requirements	Mitigation – Surface Water Drainage
Development should be directed away from the northeastern area of the site, and towards the southwestern and northwestern areas of the site where there is less 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 the high risk events, there is an increase in extent around the pre-existing areas of high risk, with three new areas of high risk forming in the eastern, central and western areas of the site. The maximum depth increases from <0.2m to 0.3m, the maximum velocity increases from 0.0m/s to 0.25m/s and the maximum hazard increases from 0.5 to 0.75. During the medium risk events, the extents increase around the pre-existing areas of medium risk, particularly in the northern section of the site. The maximum velocity increases from 0.25m/s to 0.5m/s. The maximum depth and hazard remain unchanged.	



During the low risk events, the extent increases around the pre-existing areas of low risk, with additional areas in the northern and southeastern sections of the site. The maximum velocity increases from 0.5m/s to 1.0 m/s and the maximum hazard increases from 0.75 to 1.25. The maximum depth remains unchanged.

Risk Assessment				
Parameter	High	Medium	Low	Units
Max. Depth	<0.2	0.3	0.3	m
Max. Velocity	0.0	0.25	0.5	m/s
Max. Hazard	0.5	0.75	0.75	N/A

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

1.4 Sewer

Risk Assessment	Mitigation Requirements
The site is assumed to be served by separate surface water and foul sewer networks, given their proximity to the site. There is no data regarding the sewer flooding incidents for this postcode area.	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 has a limited potential for groundwater flooding to occur. The site is underlain by Thanet Sand Formation bedrock geology. The superficial deposits include Alluvium along the southern sections of the site. There is no information regarding the superficial deposits for the rest 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 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.



1.7 Planning Considerations – Safety of Development

A. Can the development be future proofed for climate change considerations? • Surface water flood risk extent is expected to increase in the high, medium and low risk events due to climate change. The maximum velocity increases in all events, the maximum depth increases in the high risk event, and the maximum hazard increases in the high and low risk events. • The extent of fluvial flooding from the Marsh Dykes model reduces due to climate change, however the maximum flood level and velocity are expected to increase. • In the Thames Tidal Breach Downriver modelled scenarios, the extent does not change due to climate change, as the site is already fully inundated. 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, 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 comprised of both impermeable and permeable areas, with impermeable areas including the roadways, existing building and car park, and the permeable areas surrounding these areas. • 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? • Development should be directed towards the southwestern and northwestern areas of the site, however away from the boundaries, where there is less 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 requirements 4.4.



E. Which safe access and egress routes are recommended?
• Safe access and egress should be directed towards Bentham Road to the southeast of the site where there is less risk of surface water and fluvial flooding. • 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 8m of a Main River.
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. • There are areas of the site that are located within Flood Zone 3b, where 'More Vulnerable' use would not be permitted.

