

Charlton Riverside - Central

Summary Information	
Site Reference	P3-C5
Address	Charlton Gate Business Park / Stone Lake Retail Park / Penhall Road
Area (ha)	16.98
Current Use	Industrial, Commercial / Retail.
Current Vulnerability	Less Vulnerable
Proposed Use	Mixed-use development comprising residential, new local centre, industrial, commercial and education uses.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	0.00	% of site	Limited potential for flooding to occur	99.56	% of site
FZ3a	100	% of site	Potential for flooding of properties below ground level	0.44	% of site
FZ3b	0.00	% of site	Potential for flooding to occur at surface	0.00	% of site
Surface Water			Sewer Flooding		
High	13.70	% of site	Number of incidents within the predominant postcode	10 - 20	
Medium	29.79	% of site	Is the site located within the Thamesmead area?	No	
Low	54.04	% 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 breach flooding from the River Thames which is located approximately 95m north of the site at its closet point. - During the 2005 Thames Upriver modelled event, tidal flood risk is concentrated in the eastern area of the site, and in the southwestern corner. - During the 2100 Thames Upriver modelled event, the 2005 extent extends to cover the majority of the eastern area of the site, and further into the southwestern corner of the site. - During the 1 in 200 year (2005) Thames Downriver modelled event, the majority of the site is inundated, excluding a few small sections across the site and two larger sections in the western area of the site. - During the 1 in 1000 year (2005) Thames Downriver modelled event, tidal flood risk covers the majority of the site other than a section in the western area of the site and two small areas in the eastern area of the site. - During the 1 in 200 and 1 in 1000 year (2115) Thames Downriver modelled events, the site becomes inundated with the exception of two small areas in the eastern 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. - Sea Level Allowances, provided by the EA, should be considered to inform flood resilient construction and design measures. - The development should allow for safe, dry access to high ground as the extent of inundation covers the majority of the site in some scenarios.
Climate Change Considerations
Although the site is impacted by both the Thames Breach Upriver and Downriver models, as the Downriver model indicates higher depths, this model will be assessed. Developers will need to consider both models. During the Thames Breach Downriver 1 in 200 year events, climate change is expected to increase the extent to where it inundates almost the entire site other than two small areas in the eastern area of the site. The maximum depth increases from 4.59m to 5.79m, the maximum velocity increases from 2.66m/s to 2.75m/s, the maximum flood level increases from 5.47mAOD to 6.13mAOD and the maximum hazard increases from 4.16 to 6.01.



During the Thames Breach Downriver 1 in 1000 year events, climate change is also expected to increase the extent to where it inundates almost the entire site other than two small areas in the eastern area of the site. The maximum depth increases from 5.24m to 6.06m, the maximum velocity remains as 2.80m/s, the maximum flood level increases from 5.70m AOD to 6.37m AOD and the maximum hazard increases from 4.76 to 6.65.

Risk Assessment (Tidal – Thames Breach Downriver 2018)					
Parameter	2005_0200	2005_1000	2115_0200	2115_1000	Units
Max. Depth	4.59	5.24	5.79	6.06	m
Max. Velocity	2.66	2.80	2.75	2.80	m/s
Max Flood Level	5.47	5.70	6.13	6.37	m AOD
Max Ground Level	8.86	8.86	8.86	8.86	m AOD
Min Ground Level	0.67	0.67	0.67	0.67	m AOD
Max Flood Hazard	4.16	4.76	6.01	6.65	N/A

1.2 Surface Water

Description of Flood Mechanism	
Surface water flood risk is primarily concentrated along the eastern section and southwestern corner of the site. Areas of high flood risk occur across several parts of the site, most notably along the eastern boundary, within the central areas, and in the southwestern areas of the site.	
Mitigation – Flood Risk Requirements	Mitigation – Surface Water Drainage
Development should be directed away from the eastern edge of the site, the central-eastern area of high flood risk, and other areas of localised high surface water flood risk across the site.	See SFRA Level 2 Report mitigation requirement 5.0 for further development stipulations.
Development should comply with SFRA - Level 2 Report Section 4 mitigation requirement numbers 4.3 and 4.9.	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 around the pre-existing areas of high surface water flood risk, particularly in the southwestern corner, central and eastern areas of the site where there is a significant increase in these areas. The maximum depth increases from 0.6m to 0.9m, the maximum velocity increases from 0.5m/s to 1.0m/s and the maximum hazard remains unchanged.	



During the medium risk events, the extent predominantly increases across the eastern areas of the site, with some increase in other areas with pre-existing risk including the southwestern corner. The maximum depth, velocity and hazard remain unchanged.

During the low risk events, the extent expands significantly across the eastern and central areas of the site, with further expansion in some of the pre-existing areas of risk. The maximum depth, velocity, and hazard remain unchanged.

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

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

1.3 Sewer

Risk Assessment	Mitigation Requirements
The site falls predominantly within a postcode area where there are 10 – 20 reported flood incidents from sewer flooding. The western area of 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 separate combined, 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.



1.4 Groundwater

Risk Assessment	Mitigation Requirements
The site predominantly has a limited potential for groundwater flooding to occur. There is a very small area which has potential for flooding of properties below ground level in the west of the site. The site is underlain by Sussex White Chalk Formation bedrock geology and the superficial deposits in the southern section of the site are comprised of 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, Walthamstow No.4, Walthamstow No.5, and William Girling 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?
	- Climate change is expected to increase the extent of tidal flood risk to inundate most of the site in the Downriver modelled scenarios, with the exception of some smaller areas. The maximum depth, flood level and hazard increase in the climate change scenarios. The maximum velocity only increases in the 1 in 200 year climate change scenario. - 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 and velocity increase in a high risk event. - 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 4.3, 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 changing from 'Less Vulnerable' to 'More Vulnerable'. - The site is predominantly comprised of impermeable surfaces, with some permeable areas within the existing car parking areas and around the perimeter of some the existing buildings. This offers an opportunity to improve flood attenuation through the new development. - 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 some of the northern, northwestern 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 should be directed to the south of the site towards Woolwich Road, using the exits where there is limited risk of surface water flooding. • Given the risk of tidal breach 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.

