

Millennium Retail Park

Summary Information	
Site Reference	P2-GP6
Address	Millennium Retail Park Car Park & 59 Bugsby's Way and land bound by Bugsby's Way, Peartree Way and Commercial Way, SE7
Area (ha)	5.33
Current Use	Large retail warehouse (B&Q and Tradepoint), extensive surface level car parking.
Current Vulnerability	Less Vulnerable
Proposed Use	Residential led mixed-use.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	0	% of site	Limited potential for flooding to occur	77.28	% of site
FZ3a	100.00	% of site	Potential for flooding of properties below ground level	22.72	% of site
FZ3b	0	% of site	Potential for flooding to occur at surface	0	% of site
Surface Water			Sewer Flooding		
High	22.17	% of site	Number of incidents within the predominant postcode	20 - 30	
Medium	26.99	% of site	Is the site located within the Thamesmead area?	No	
Low	39.18	% 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 480m northeast of the site. - During the 2005 Thames Upriver modelled event, most of the site is inundated with the exception of an isolated extent in the northwestern area of the site and several other smaller isolated extents within the northern section of the site. - During the 2100 Thames Upriver modelled event, most of the site is inundated with the exception of a couple of very small isolated extents in the northern areas of the site. - During the 1 in 200 year (2005) Thames Downriver modelled event, tidal flood risk is concentrated along the southwestern, southeastern and northeastern boundaries of the site. - During the 1 in 1000 year (2005) Thames Downriver modelled event, tidal flood risk is concentrated in the southern and northeastern areas of the site. - During the 1 in 200 year (2115) Thames Downriver modelled event, tidal flood risk is concentrated in the southern and northeastern areas of the site and along the northwestern boundary of the site. - During the 1 in 1000 year (2115) Thames Downriver modelled event, the majority of the site is inundated with the exception of an isolated extent in the northwestern 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 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 majority of the site. - 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 Upriver and Downriver modelled events, as the Upriver model indicates higher depths, this model will be assessed. Developers should consider both models. Climate change is expected to increase the extent of tidal flood risk to inundate most of the site with the exception of a couple of very small isolated extents in the northern section of the site.



The maximum depth increases from 1.83m to 2.45m, the maximum velocity increases from 0.78m/s to 1.04m/s, the maximum flood level increases from 3.82mAOD to 4.34mAOD and the maximum hazard increases from 2.00 to 2.23.

Risk Assessment (Tidal – Thames Breach Upriver 2017)			
Parameter	2005	2100	Units
Max. Depth	1.83	2.45	m
Max. Velocity	0.78	1.04	m/s
Max Flood Level	3.82	4.34	m AOD
Max Ground Level	4.88	4.88	m AOD
Min Ground Level	1.75	1.75	m AOD
Max Flood Hazard	2.00	2.23	N/A

1.2 Surface Water

Description of Flood Mechanism	
Surface water flood risk is concentrated in the western area of the site with isolated extents across the southeast. High risk is concentrated within the existing building curtilage as well as across the carpark and the onsite roadway (Commercial Way).	
Mitigation – Flood Risk Requirements	Mitigation – Surface Water Drainage
Development should be directed away from the western and southeastern areas of the site, and toward the very northern and eastern areas of 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 extents mostly increase around the existing areas of high risk, with some new areas of high risk forming within the eastern and western areas of the carpark and in the northern section of the site. The maximum depth increases from 0.3m to 0.6m whilst the maximum velocity and hazard remain unchanged.	
During the medium risk events, the extents mostly increase around the existing areas of medium risk. In particular, the extent in the northern area of the site extends northward, and the extents in the eastern area of the site extends eastward. The maximum depth	



increases from 0.6m to 0.9m whilst the maximum velocity and hazard remain unchanged.

During the low risk events, the extents predominantly increase around the existing areas of low risk. In particular, the extent in the northern area of the site extends eastward. The maximum depth, velocity and hazard remain unchanged.

Risk Assessment				
Parameter	High	Medium	Low	Units
Max. Depth	0.3	0.6	1.2	m
Max. Velocity	0.5	0.25	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	0.25	1.0	m/s
Max. Hazard	1.25	1.25	1.25	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 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 mostly has limited potential for groundwater flooding to occur with potential for groundwater flooding of property situated below ground level in the southeastern corner of the site. The site is predominantly underlain by a bedrock geology of Thanet Sand Formation, and Sussex White Chalk Formation in the southeastern area of the site. The supericial 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 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 onsite. - Surface water flood risk extent is expected to increase slightly 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 4.3, 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 largely impermeable with smaller permeable areas along the northern, eastern and southern boundaries of the site and scattered throughout the car park. • 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 toward the northern and eastern 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 Bugsby's Way to the north of the site where there is less risk of surface 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?
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.

