Pettman Crescent North

Summary Information	
Site Reference	P5-TA1
Address	Land Bounded by Pettman Crescent, SE28
Area (ha)	1.38
Current Use	Partly vacant with planning permission for residential development. Commercial units: Woolwich Trade Park and Enterprise Car Rental.
Current Vulnerability	Less Vulnerable
Proposed Use	Residential led mixed-use development with commercial units.
Proposed Vulnerability	More Vulnerable

Current Risk Summary					
Fluvial / Tidal			Groundwater		
FZ2	0.00	% of site	Limited potential for flooding to occur	0.00	% of site
FZ3a	100	% 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	2.17	% of site	Number of incidents within the predominant postcode	10 - 20	
Medium	3.63	% of site	Is the site located within the Thamesmead area?	No	
Low	10.69	% 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 650m northwest of the site at its closet point. The site is fully inundated in all Thames Downriver modelled events.
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 entire site in all modelled scenarios.
Climate Change Considerations
During the Thames Breach Downriver 1 in 200 year event, there is no change in the extent due to climate change as the site remains fully inundated. The maximum depth increases from 1.57m to 2.64m, the maximum velocity increases from 0.84m/s to 1.35m/s, the maximum flood level increases from 3.47mAOD to 4.55mAOD and the maximum hazard increases from 1.79 to 2.49. During the Thames Breach Downriver 1 in 1000 year event, there is no change in the extent due to climate change as the site remains fully inundated. The maximum depth increases from 1.84m to 2.94m, the maximum velocity increases from 1.00m/s to 1.51m/s, the maximum flood level increases from 3.74mAOD to 4.85mAOD and the maximum hazard increases from 1.94 to 2.73.

Risk Assessment (Tidal – Thames Breach Downriver 2018)					
Parameter	2005_0200	2005_1000	2115_0200	2115_1000	Units
Max. Depth	1.57	1.84	2.64	2.94	m
Max. Velocity	0.84	1.00	1.35	1.51	m/s
Max Flood Level	3.47	3.74	4.55	4.85	m AOD
Max Ground Level	3.23	3.23	3.23	3.23	m AOD
Min Ground Level	1.87	1.87	1.87	1.87	m AOD
Max Flood Hazard	1.79	1.94	2.49	2.73	N/A

1.2 Surface Water

Description of Flood Mechanism	
Surface water flood risk is present along the site boundaries, with further areas of risk in the northwestern and central western areas. The high risk areas are located within the central western part of the site and along the eastern and western boundaries.	
Mitigation – Flood Risk Requirements	Mitigation – Surface Water Drainage
Development should be directed away from the site boundaries and the central western area of the site. 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, flooding extends along the western and eastern site boundaries and in the central western area. The maximum depth, velocity and hazard remain unchanged. During medium risk events, flooding extends further around the existing areas of risk along the western and eastern site boundaries and in the central western area. The maximum velocity increases from 0.0m/s to 0.25m/s while the maximum depth and hazard remain unchanged. During low risk events, flood extents increase around the site boundaries. Flood risk extends within the northern and eastern site areas and around the existing area in the central western area of the site. There are new areas of low risk across some of the central areas of the site. The maximum depth, velocity and hazard remain unchanged.	

Risk Assessment				
Parameter	High	Medium	Low	Units
Max. Depth	0.3	0.3	0.3	m
Max. Velocity	0.0	0.0	1.0	m/s
Max. Hazard	0.75	0.75	1.25	N/A

Risk Assessment – with Climate Change				
Parameter	High	Medium	Low	Units
Max. Depth	0.3	0.3	0.3	m
Max. Velocity	0.0	0.25	1.0	m/s
Max. Hazard	0.75	0.75	1.25	N/A

1.3 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.

1.4 Groundwater

Risk Assessment	Mitigation Requirements
This site has potential for groundwater flooding of property situated below ground level. The site is underlain by the Thanet Sand Formation bedrock geology and the superficial deposits 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 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?
• 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 the medium risk event. • The site remains fully inundated within all Thames Tidal Breach Downriver modelled scenarios and therefore there is no change in the extent due to climate change. The maximum depth, velocity and flood 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 4.3, 4.7, 4.8, 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 largely impermeable, with permeable areas located along the northern boundary of the site and another permeable area located in the west 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 northern 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 towards Pettman Crescent 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.