

SITE 2.1.18 : Royal Mail Group Site, Ponton Road, SW8

1) PROPOSED DEVELOPMENT

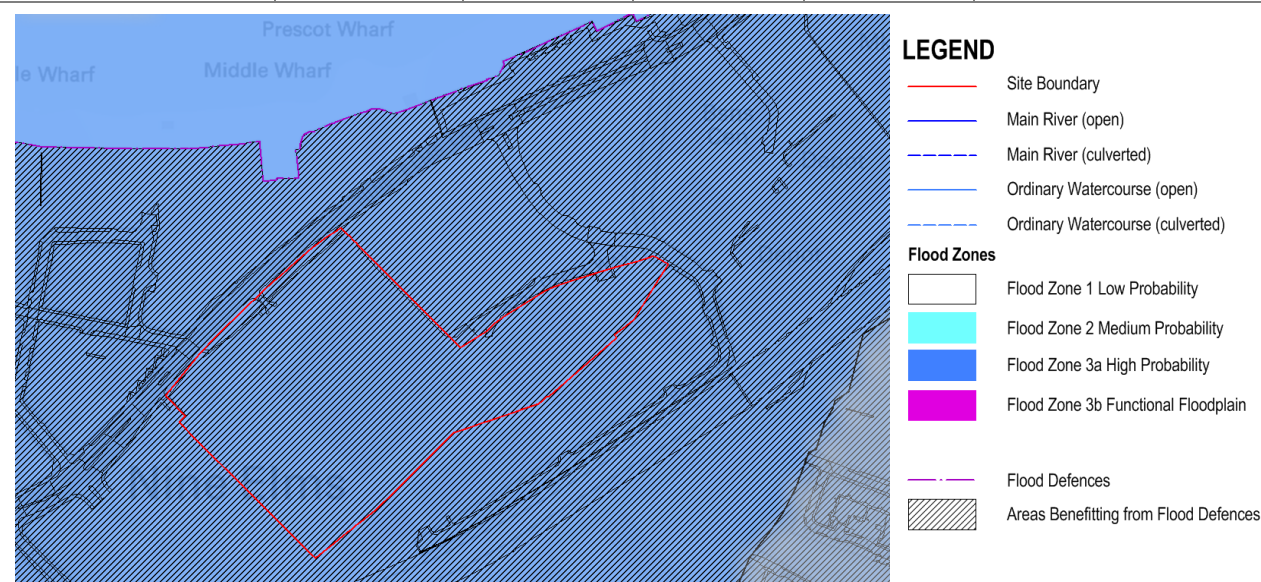
Site ID	2.1.18
Site Address	Royal Mail Group Site, Ponton Road, SW8
Site Area	5.43 ha
Current Use	Post Office sorting depot
Allocated Use	Mixed use development including residential. Provision for a primary school including some nursery provision and sports pitches on part of the site in accordance with the Area Spatial Strategy.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



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Flood risk from all other sources			Limitations
Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	High Risk 1 in 30 year (3.33% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	1 Internal	0	0

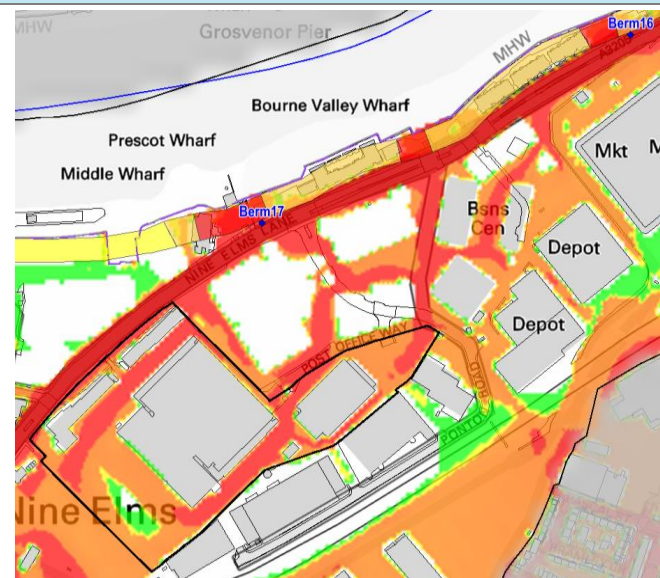
SITE 2.1.18 : Royal Mail Group Site, Ponton Road, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 2 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the frontage adjacent to the site as Category 2, 3 and 4.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 3: Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m-1.0m.

Category 4: Assumed Breach Level of <4.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) >1.0m.

SITE 2.1.18 : Royal Mail Group Site, Ponton Road, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The development site is entirely within Flood Zone 3a of the River Thames. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario the site is at risk of flooding of greater than 1.5m in depth (to the north east of the development site). To the south east of the site, a risk of flooding of between 0.1m-0.25m is apparent. A discrete area to the south of the site and in areas of current development, are at a risk of flooding to depths of <0.1m. Under this scenario, there are large areas of the development site which are shown to be at 'Significant Hazard' and 'Extreme Hazard'. The areas of current development and a small section to the south of the site are shown to be of 'No Hazard' or 'Low Hazard'. More vulnerable development, such as the primary school and nursery should be located to the south and south-east of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses, such as the proposed sports pitches should be located in areas of greater hazard i.e. to the north east of the site. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses, finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at high risk of surface water flooding and it is considered that finished floor levels should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level to protect the property from a 0.33% annual probability (1 in 30 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Nine Elms Lane and Post Office Way. In the event of widespread flooding associated with a breach in the Thames Tidal Defence system, there is potential that dry routes out of the local area to a safe place of refuge may be limited. It will therefore be necessary to prepare a Flood Warning and Evacuation Plan (FWEP), described further below. In the first instance, safe egress should be sought via Post Office Way.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 24.1 l/s (1 in 1 year), 90.6 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 10.9 l/s	

SITE 2.1.18 : Royal Mail Group Site, Ponton Road, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. The site is within a Groundwater Source Protection Zone 1 (SPZ1). Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, however it is defended by the Thames Tidal Defences. For this development site, the most vulnerable development, such as the residential properties, the primary school and nursery, should be located in areas of low hazard. Less Vulnerable uses, such as the proposed sports pitches should be located in areas of greater hazard i.e. to the north east of the site. Finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. There is potential that dry routes out of the local area to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.19 : Christies Auctioneers Depot, Ponton Road, SW8

1) PROPOSED DEVELOPMENT

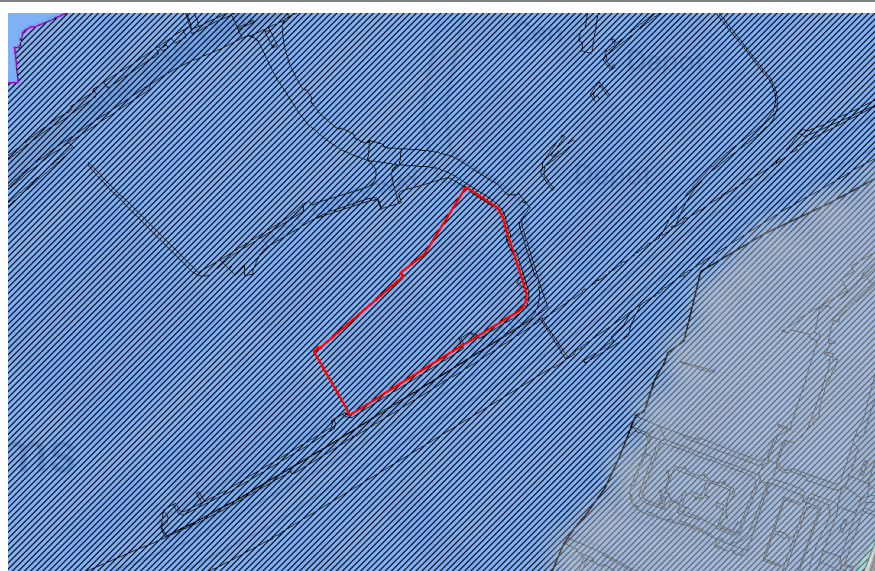
Site ID	2.1.19
Site Address	Christies Auctioneers Depot, Ponton Road, SW8
Site Area	1.07 ha
Current Use	Auctioneers
Allocated Use	Mixed use development including residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- - - Main River (culverted)
- Ordinary Watercourse (open)
- - - Ordinary Watercourse (culverted)
- Flood Zones**
- Flood Zone 1 Low Probability
- Flood Zone 2 Medium Probability
- Flood Zone 3a High Probability
- Flood Zone 3b Functional Floodplain
- Flood Defences
- ▨ Areas Benefitting from Flood Defences

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Flood risk from all other sources

Limitations

Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	Medium Risk 1 in 100 year (1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Low Risk Limited potential for groundwater flooding	

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

SITE 2.1.19 : Christies Auctioneers Depot, Ponton Road, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

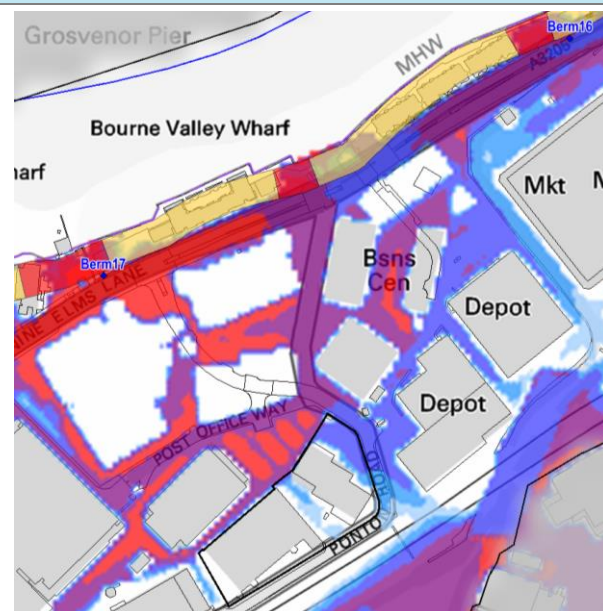
- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 2 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the frontage adjacent to the site as Category 2 and 3.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 3: Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m-1.0m.

SITE 2.1.19 : Christies Auctioneers Depot, Ponton Road, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The entirety of the development site is within Flood Zone 3a of the River Thames. The majority of the site is identified as being at a 'No Hazard' or 'Low Hazard'. However, there are central areas of the development site and areas to the northeast of the site which are shown to have 'Moderate' and 'Significant Hazard'. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario the majority of the site is at risk of flooding to depths of <0.1m. To the centre of the site there are areas which are at risk of flooding from depths of 0.25m-0.5m. The north eastern boundary of this site is at risk of flooding up to 1m in depth. More vulnerable development, such as residential uses, should be located to the south and west of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses should be located in areas of greater hazard i.e. to the northeast and central to the site. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses (such as commercial development), finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at medium risk of surface water flooding and it is considered that finished floor levels should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level to protect the property from a 0.33% annual probability (1 in 30 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Ponton Road to the south of the site. In the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at medium risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 4.8 l/s (1 in 1 year), 17.9 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10

SITE 2.1.19 : Christies Auctioneers Depot, Ponton Road, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, however it is defended by the Thames Tidal Defence. For this development site, the most vulnerable development should be located in areas of low hazard to the south and west of the site. The More Vulnerable uses should be located on the first floor or above, with Less Vulnerable uses at ground level. There is potential that dry routes out of the local area to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.20 : Government Car and dispatch agency, Ponton Road, SW8

1) PROPOSED DEVELOPMENT

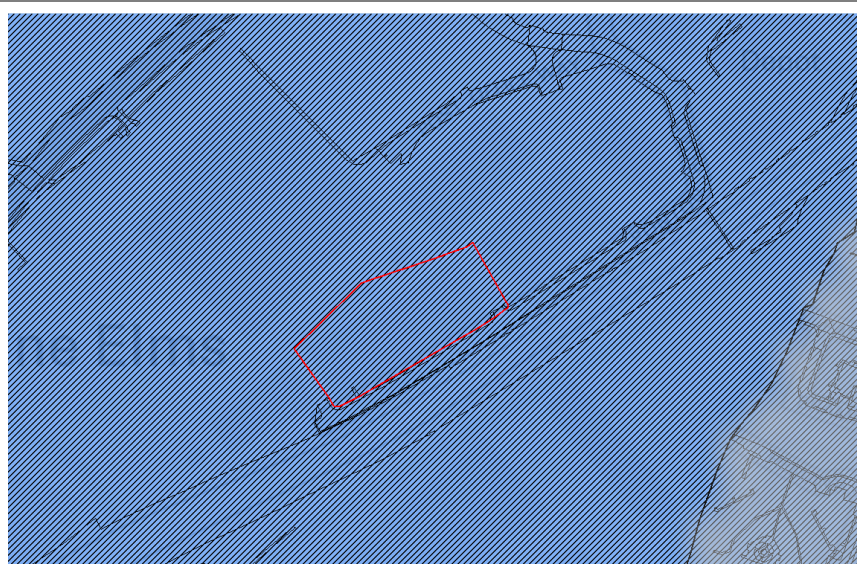
Site ID	2.1.20
Site Address	Government Car and dispatch agency, Ponton Road, SW8
Site Area	0.83 ha
Current Use	Depot
Proposed Use	Mixed use development including residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Zones**
 - Flood Zone 1 Low Probability
 - Flood Zone 2 Medium Probability
 - Flood Zone 3a High Probability
 - Flood Zone 3b Functional Floodplain
- Flood Defences
- Areas Benefiting from Flood Defences

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Flood risk from all other sources

Limitations

Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	Medium Risk 1 in 100 year (1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Low Risk Limited potential for groundwater flooding	

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

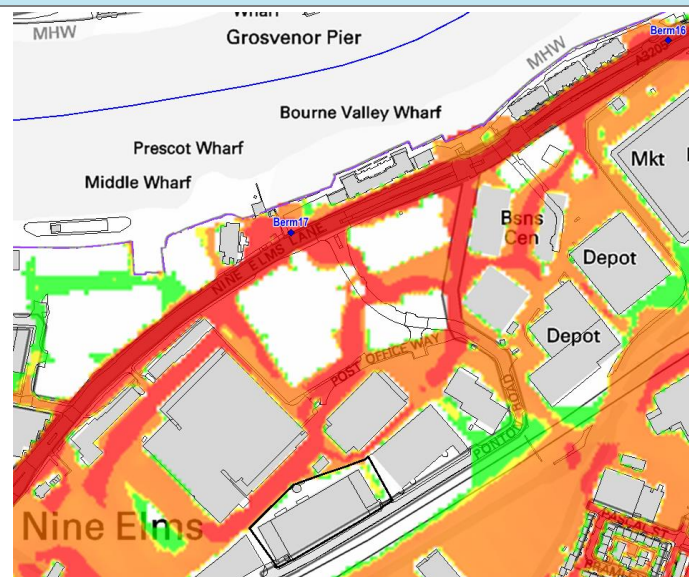
SITE 2.1.20 : Government Car and dispatch agency, Ponton Road, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

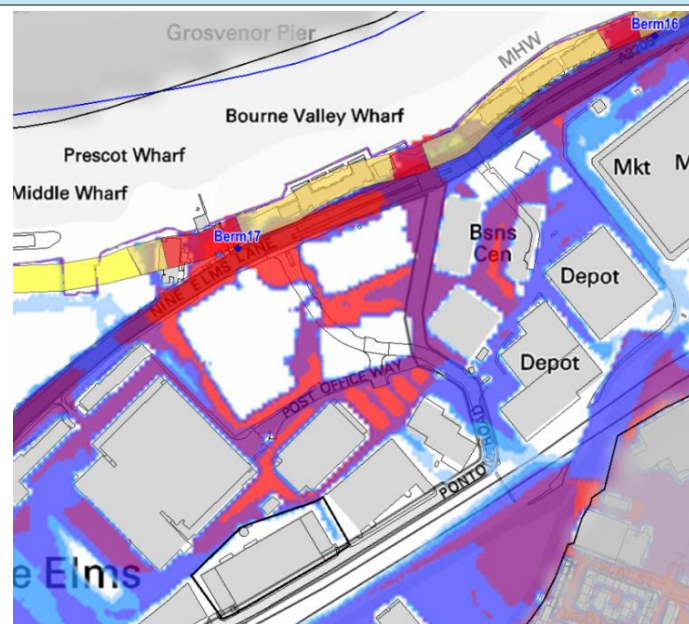
- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 2 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the frontage adjacent to the site as Category 2 and 3.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 3: Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m-1.0m.

SITE 2.1.20 : Government Car and dispatch agency, Ponton Road, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The development site is entirely within Flood Zone 3a of the River Thames, defended by the Thames Tidal Defences. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of <0.1m. To the east, the site is at risk of flooding up to 0.5m in depth. To the northern boundary, the site is at risk of flooding to depths of 1m. Under this scenario, the majority of the site is identified as being at a 'No Hazard' or 'Low Hazard'. However, there are areas to the east of the site and to the northern boundary which are shown to be and 'Moderate Hazard' and 'Significant Hazard' respectively. More vulnerable development, such as residential uses, should be located centrally and to the south and west of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses should be located in areas of greater hazard i.e. to the northern boundary and to the east of the site. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses (such as commercial development), finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at medium risk of surface water flooding and it is considered that finished floor levels should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level to protect the property from a 0.33% annual probability (1 in 30 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Ponton Road to the south of the site. In the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at medium risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 3.7 l/s (1 in 1 year), 13.8 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10

SITE 2.1.20 : Government Car and dispatch agency, Ponton Road, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, and is defended by the Thames Tidal Defences. In the event of a breach in the tidal defences, the development site is within an area of low to moderate hazard. For this development site, the most vulnerable development should be located in areas of lowest hazard to the centre, the south and west of the site. There is potential that dry routes out of the local area to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.21 : Metropolitan Police Warehouse Garage, Ponton Road, SW8

1) PROPOSED DEVELOPMENT

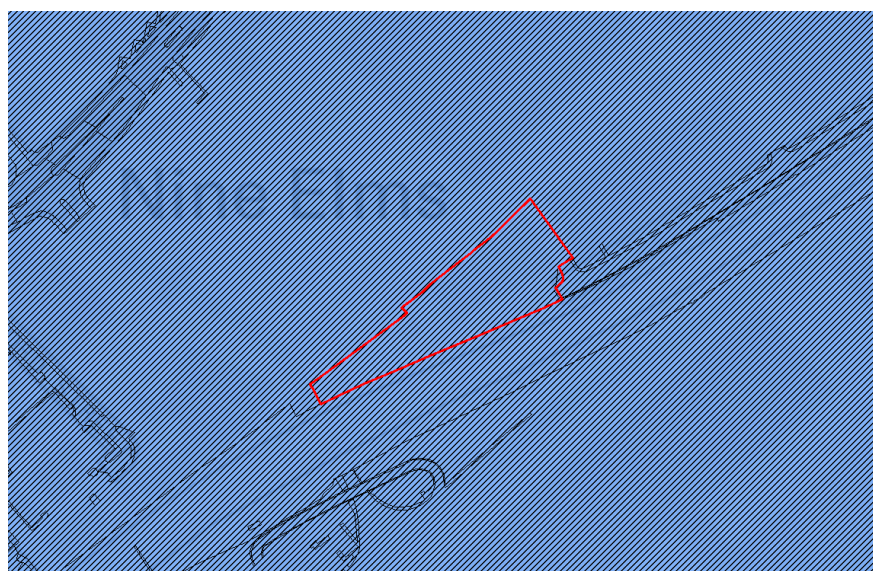
Site ID	2.1.21
Site Address	Metropolitan Police Warehouse Garage, Ponton Road, SW8
Site Area	0.55 ha
Current Use	Warehouse
Allocated Use	Mixed use development including residential. Provision for a primary school and sports pitches on part of the site in accordance with the Area Spatial Strategy.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- - - Main River (culverted)
- Ordinary Watercourse (open)
- - - Ordinary Watercourse (culverted)
- Flood Zones**
- Flood Zone 1 Low Probability
- Flood Zone 2 Medium Probability
- Flood Zone 3a High Probability
- Flood Zone 3b Functional Floodplain
- - - Flood Defences
- ▨ Areas Benefiting from Flood Defences

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Flood risk from all other sources			Limitations
Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	High Risk 1 in 30 year (3.33% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

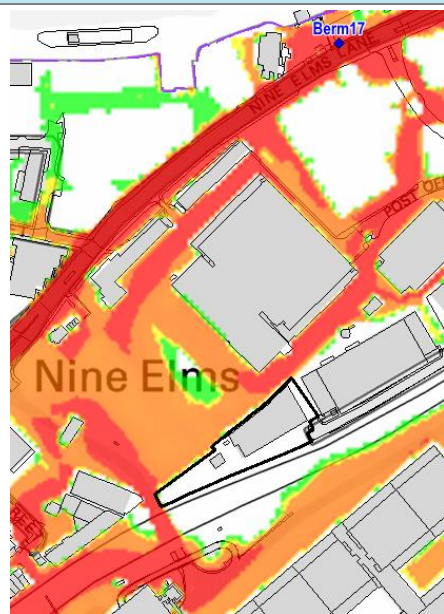
SITE 2.1.21 : Metropolitan Police Warehouse Garage, Ponton Road, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 3 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the frontage adjacent to the site as Category 2 and 3.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 3: Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m-1.0m.

SITE 2.1.21 : Metropolitan Police Warehouse Garage, Ponton Road, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The development site is entirely within Flood Zone 3a of the River Thames and defended by the Thames Tidal Defences. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of <0.1m. To the northern boundary, the site is at risk of flooding to depths of 1m. To the western boundary there are risk of flooding >1.5m. Under this scenario, the majority of the site is identified as being at a 'No Hazard'. However, the area adjacent to the northern boundary is shown to be 'Significant Hazard' and adjacent to the western boundary that are 'Extreme Hazard'. More vulnerable development (such as residential uses) should be located centrally and to the south and east of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses should be located in areas of greater hazard to the northern and western boundary. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses, finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at high risk of surface water flooding and it is considered that finished floor levels should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level to protect the property from a 0.33% annual probability (1 in 30 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Ponton Road to the south of the site. In the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 2.5l/s (1 in 1 year), 9.2 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10

SITE 2.1.21 : Metropolitan Police Warehouse Garage, Ponton Road, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames and defended by the Thames Tidal Defences. In the event of a breach in the tidal defences, the development site is within an area of low hazard, however the area adjacent to the northern boundary is of significant hazard and the area adjacent to the western boundary is of extreme hazard, which should be considered during site layout and for emergency access. The most vulnerable development should be located in areas of lowest hazard to the south of the site. It is necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.23 : Brooks Court, Kirtling Street, SW8

1) PROPOSED DEVELOPMENT

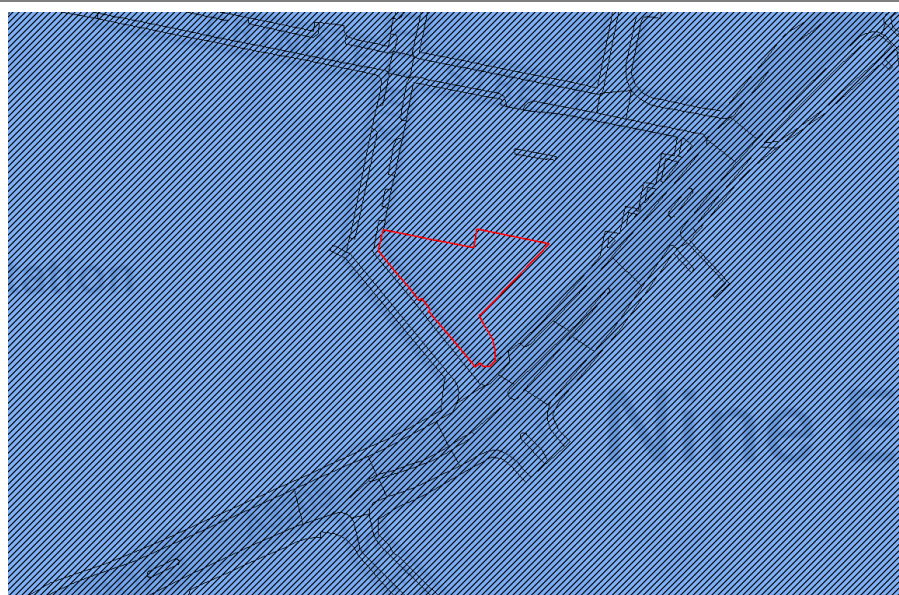
Site ID	2.1.23
Site Address	Brooks Court, Kirtling Street, SW8
Site Area	0.18 ha
Current Use	Offices
Allocated Use	Mixed use development including residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Zones**
 - Flood Zone 1 Low Probability
 - Flood Zone 2 Medium Probability
 - Flood Zone 3a High Probability
 - Flood Zone 3b Functional Floodplain
- Flood Defences
- Areas Benefitting from Flood Defences

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Flood risk from all other sources

Limitations

Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	Low Risk Less than 1 in 1000 year (0.1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

SITE 2.1.23 : Brooks Court, Kirtling Street, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 2 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the majority of the frontage adjacent to the site as Category 1, due to the high ground levels behind the defences. A section to the west of the site has been assessed as Category 2, with an Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

SITE 2.1.23 : Brooks Court, Kirtling Street, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The entirety of the development site is within Flood Zone 3a of the River Thames. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of <0.1m. The north-east of the site is at risk of flooding to depths of 1m, with very small areas shown as being at risk of flood depths up to 1.5m. Under this scenario, the majority of the site is identified as being at a 'No Hazard'. However, there are areas to the northeast of the site which are shown to be 'Moderate Hazard' and 'Extreme Hazard'. To the western boundary there are small areas of 'Extreme Hazard'. There are discrete areas of 'low' risk along the boundary of the site. More vulnerable development (such as residential uses) should be located to the west of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses, such as offices and commercial uses, should be located in areas of greater hazard i.e. to the north eastern boundary. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses, finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at low risk of surface water flooding.	Section 9.3
Safe Access/Egress	Access to the site is provided via Kirtling Street to the west of the site. In the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at low risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 0.8 l/s (1 in 1 year), 2.9 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10

SITE 2.1.23 : Brooks Court, Kirtling Street, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. The site is within a Groundwater SPZ1. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames and defended by the Thames Tidal Defences. For this development site, the most vulnerable development should be located in areas of lowest hazard, to the east of the site. Finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. In the event of a breach in the tidal defences, there is potential that dry routes out of the local area to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.24 : 49-59 Battersea Park Road, SW8

1) PROPOSED DEVELOPMENT

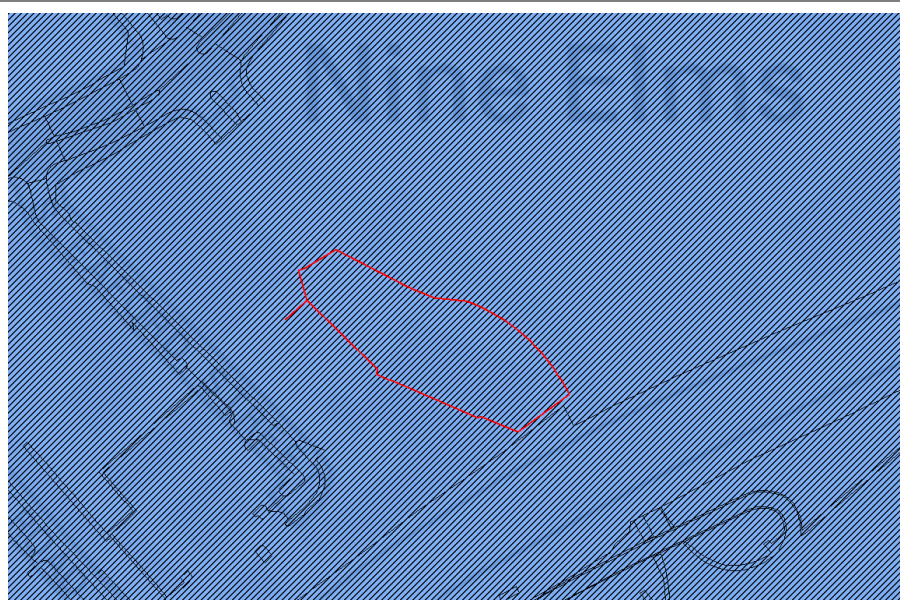
Site ID	2.1.24
Site Address	49-59 Battersea Park Road, SW8
Site Area	0.32 ha
Current Use	Car servicing centre.
Allocated Use	Mixed use development including residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Zones**
 - Flood Zone 1 Low Probability
 - Flood Zone 2 Medium Probability
 - Flood Zone 3a High Probability
 - Flood Zone 3b Functional Floodplain
- Flood Defences
- Areas Benefiting from Flood Defences

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Flood risk from all other sources

Limitations

Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	High Risk 1 in 30 year (3.33% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Low Risk Limited potential for groundwater flooding	

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

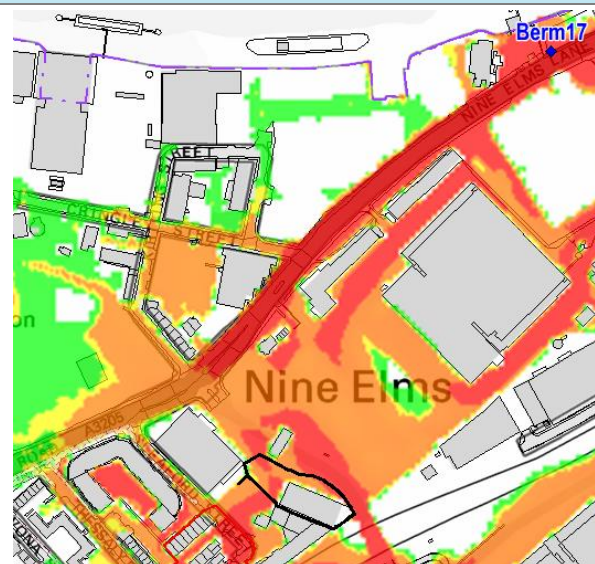
SITE 2.1.24 : 49-59 Battersea Park Road, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

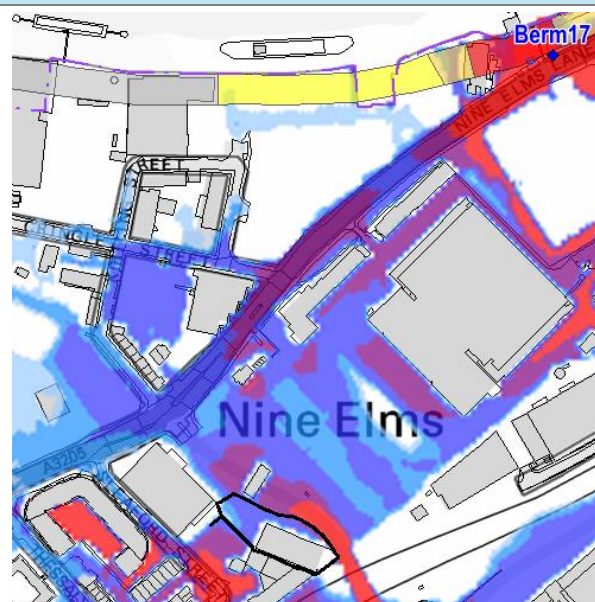
- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 3 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the majority of the frontage adjacent to the site as being Category 1 (due to high ground levels behind defences) and Category 2. A section of riverside directly to the east of the site is identified as Category 4.

Category 1: Assumed Breach Level of >5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0m.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 4: Assumed Breach Level of <4.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) >1.0m.

SITE 2.1.24 : 49-59 Battersea Park Road, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The development site is entirely within Flood Zone 3a of the River Thames, defended by the Thames Tidal Defence system. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of <0.1m. However, to the eastern border of the site there is an area identified as being at risk of flooding >1.5m. To the north and northwest of the site, there are areas at risk of flooding to a depth of 1m. Under this scenario, there is a very small area on the north western boundary of the site which is identified as 'Low Hazard', along with the perimeter of the existing building to the southeast of the site. However, there are areas to the northwest and the northeast of the site which are identified as 'Extreme Hazard' and 'Significant Hazard'. More vulnerable development (such as residential uses) should be located to the south and south west of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses should be located in areas of greater hazard i.e. to the north east and north west. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses, finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at high risk of surface water flooding and it is therefore recommended that consideration is given to the flow or surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.	Section 9.3
Safe Access/Egress	Access to the site is provided via Sleaford Street to the east of the site. However, Sleaford Street is shown as an area of 'Extreme Hazard' and therefore in the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 1.4 l/s (1 in 1 year), 5.3 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10

SITE 2.1.24 : 49-59 Battersea Park Road, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site as SuDS feasibility is uncertain for some areas of the site. The site is located within a Groundwater SPZ1. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, however it is defended by the Thames Tidal Defences. For this development site, the most vulnerable development, such as residential uses, should be located in areas of lowest hazard to the south and south west of the site. There is potential that dry routes out of the local area to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.25 : Dairy Crest Milk Distribution Depot, 55 Sleaford Street, SW8

1) PROPOSED DEVELOPMENT

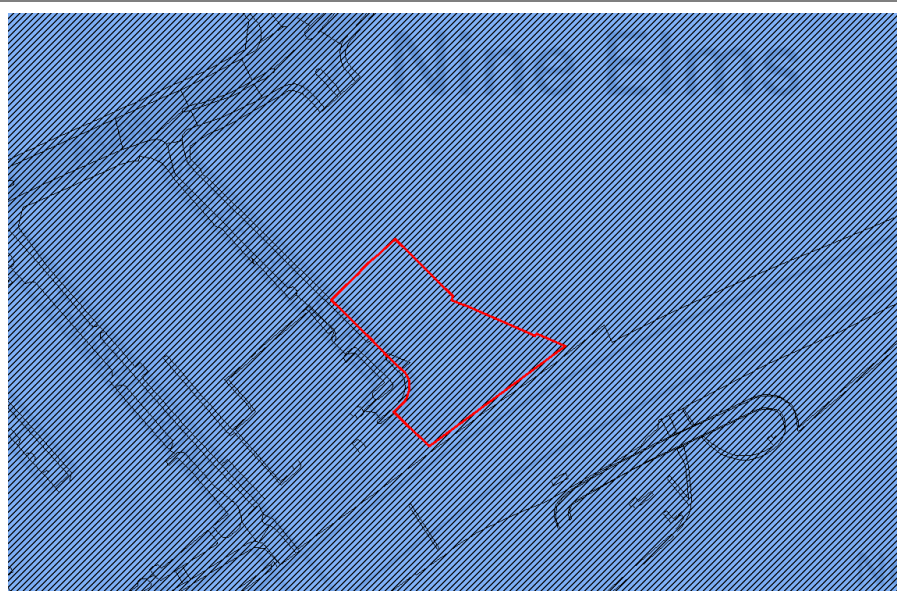
Site ID	2.1.25
Site Address	Dairy Crest Milk Distribution Depot, 55 Sleaford Street, SW8
Site Area	0.42 ha
Current Use	Milk distribution depot
Allocated Use	Mixed use development including residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Zones**
 - Flood Zone 1 Low Probability
 - Flood Zone 2 Medium Probability
 - Flood Zone 3a High Probability
 - Flood Zone 3b Functional Floodplain
- Flood Defences
- Areas Benefitting from Flood Defences

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Flood risk from all other sources

Limitations

Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	High Risk 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

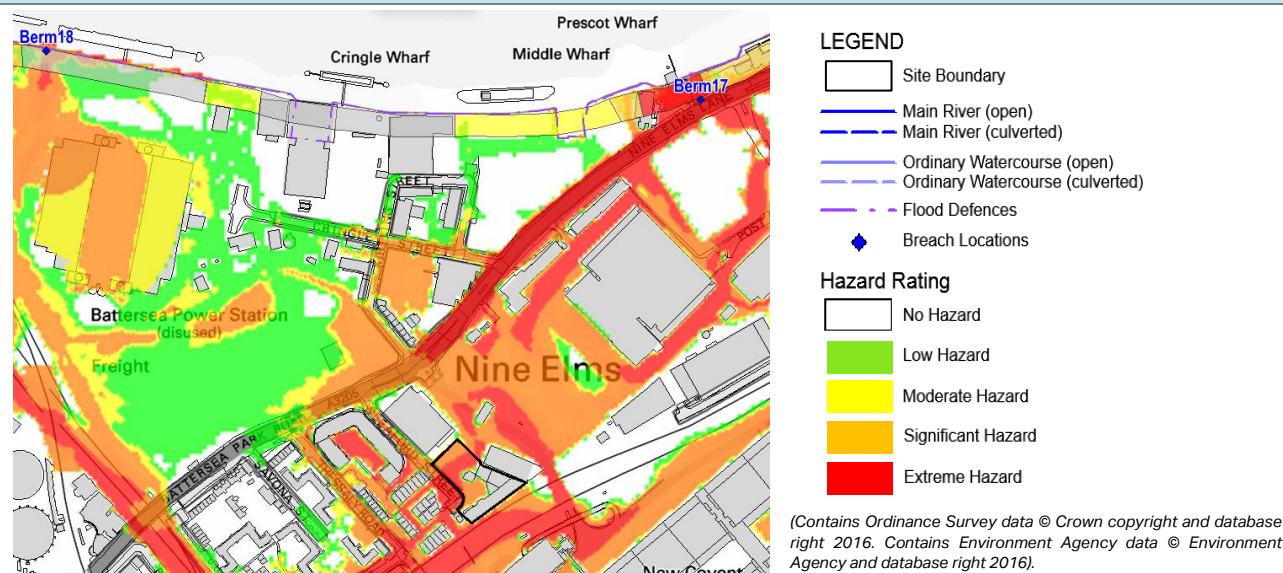
SITE 2.1.25 : Dairy Crest Milk Distribution Depot, 55 Sleaford Street, SW8

3) LEVEL 2 ASSESSMENT

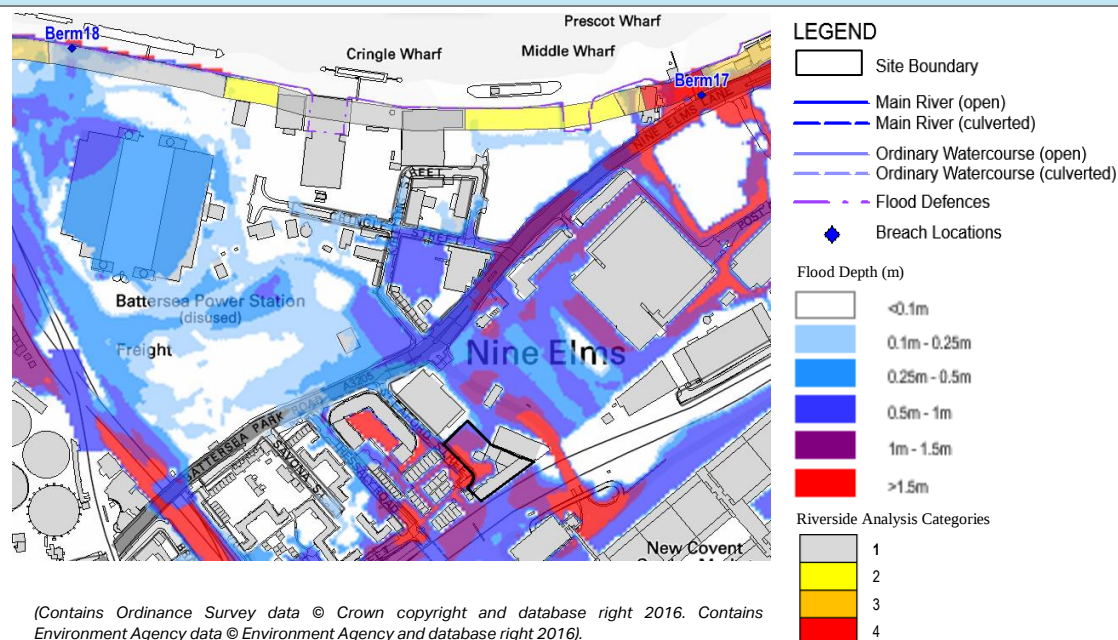
London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



Riverside Analysis

There are 3 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the majority of the frontage adjacent to the site as Category 2, with an Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m. A section to the east of the site has been assessed as Category 1 and a section to the west of the site as Category 4

Category 1: Assumed Breach Level of >5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0m.

Category 4: Assumed Breach Level of <4.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) >1.0m.

SITE 2.1.25 : Dairy Crest Milk Distribution Depot, 55 Sleaford Street, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The entirety of the development site is within Flood Zone 3a of the River Thames. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of >1.5, with a large area to the north being at risk of flooding to depths of between 1m-1.5m. The majority of the east and south of the site are at risk of surface water flooding <0.1m. Under this scenario, the majority of the site is identified at 'Extreme Hazard' or 'Significant Hazard', areas of high risk are located to the north and west of the site. There are discrete areas of 'Low' and 'Moderate' Hazard centrally. 'No Hazard' areas cover the east and southern limit of the site. More vulnerable development, such as residential uses, should be located to the south and east of the site. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses, such as commercial uses, should be located in areas of greater hazard to the north and west. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding. Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses (such as commercial development), finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at high risk of surface water flooding and it is therefore recommended that consideration is given to the flow or surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.	Section 9.3
Safe Access/Egress	Access to the site is provided via Sleaford Street to the east of the site. However, Sleaford Street is shown as an area of 'Extreme Hazard' and therefore in the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south west of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 1.9 l/s (1 in 1 year), 7.0 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10

SITE 2.1.25 : Dairy Crest Milk Distribution Depot, 55 Sleaford Street, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is uncertain for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site as SuDS feasibility is uncertain for some areas of the site. The site is located within a SPZ2. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, however it is defended by the Thames Tidal Defences. For this development site, the most vulnerable development, such as residential uses, should be located in areas of lower hazard to the south and east of the site and situated on the first floor or above. Less Vulnerable uses, such as commercial uses, should be located in areas of greater hazard to the north and west and can be situated at ground level. In the event of a breach in the tidal defences, there is potential that dry routes to a safe place of refuge may be limited, therefore it is necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.26 : Tidbury Court, Stewarts Road, SW8

1) PROPOSED DEVELOPMENT

Site ID	2.1.26
Site Address	Tidbury Court, Stewarts Road, SW8
Site Area	0.1 ha
Current Use	Residential sheltered housing.
Allocated Use	Residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- - - Main River (culverted)
- Ordinary Watercourse (open)
- - - Ordinary Watercourse (culverted)
- Flood Zones**
- Flood Zone 1 Low Probability
- Flood Zone 2 Medium Probability
- Flood Zone 3a High Probability
- Flood Zone 3b Functional Floodplain
- Flood Defences
- ▨ Areas Benefitting from Flood Defences

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Flood risk from all other sources			Limitations
Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	Low Risk Less than 1 in 1000 year (0.1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	1 Internal	0	0

SITE 2.1.26 : Tidbury Court, Stewarts Road, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm17. The invert level was 3.25 mAOD and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

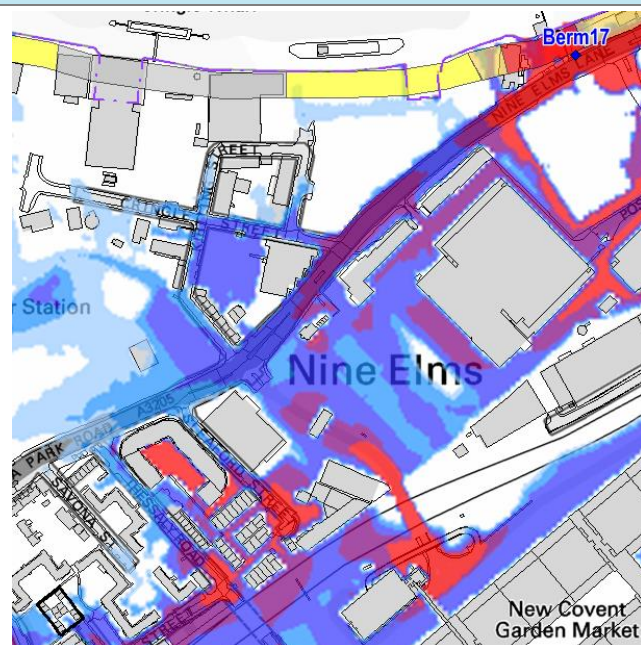
- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- ◆ Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 3 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the majority of the frontage adjacent to the site as Category 1, due to the high ground levels behind the defences and Category 2, with an Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

SITE 2.1.26 : Tidbury Court, Stewarts Road, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The whole development site is within Flood Zone 3a of the River Thames and defended by the Thames Tidal Defences. For the current development site (without mitigation), the Thames Tidal breach modelling Berm17 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of <0.1m with the central areas of the western, southern and eastern site boundaries being at risk of flooding up to depths of 0.5m-1m, with a small area of the southern boundary being at risk of flooding up to 1m-1.5m, which corresponds to a Moderate Hazard. More vulnerable development (such as residential uses) should be located centrally and to the north of the site, with all areas of the site being reasonable for vulnerable development except site boundaries to the west, south and east. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at low risk of surface water flooding.	Section 9.3
Safe Access/Egress	Access to the site is provided via Stewart's Road to the west of the site. However, Stewart's Road is shown as an area of Significant Hazard and therefore in the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south west of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at low risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are is one reported incidents of flooding held by Wandsworth Council in this location relating to internal sewer flooding.	
	Indicative existing runoff rate: 0.4 l/s (1 in 1 year), 1.7 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5 l/s	Section 10
	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is uncertain for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site as SuDS feasibility is uncertain for some areas of the site. The site is located within a SPZ2. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9

SITE 2.1.26 : Tidbury Court, Stewarts Road, SW8

	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, however it is defended by the Thames Tidal Defences. For this development site, the residential development should be located in areas of lowest hazard to the centre and north of the site. It is necessary to prepare a FWEPP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.27: New Covent Garden Market, Main Market Area, Nine Elms, SW8

1) PROPOSED DEVELOPMENT

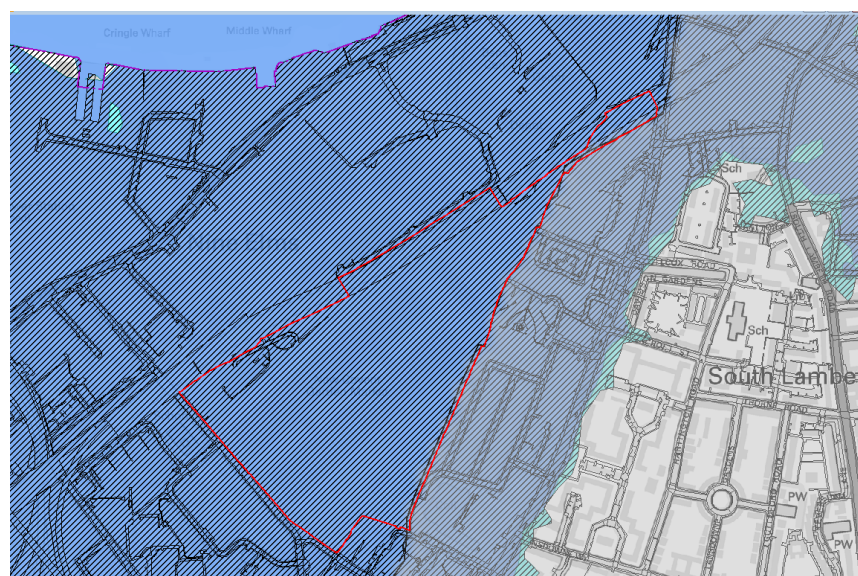
Site ID	2.1.27
Site Address	New Covent Garden Market, Main Market Area, Nine Elms, SW8
Site Area	18.07 ha
Current Use	Fruit, vegetable and flower market serving the whole of London.
Allocated Use	Retention, consolidation and intensification of the wholesale market within the New Covent Garden Market site. Higher density mixed-use development including complementary uses, e.g. hotel, restaurants, food related college, business and limited retail, and residential development at the north end (apex) of the site.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

<i>Proportion of potential development site within Flood Zone</i>	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



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Flood risk from all other sources				Limitations		
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	High Risk 1 in 30 year (3.3% annual probability)		The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.		
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding		The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.		
Historic records of flooding						
<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

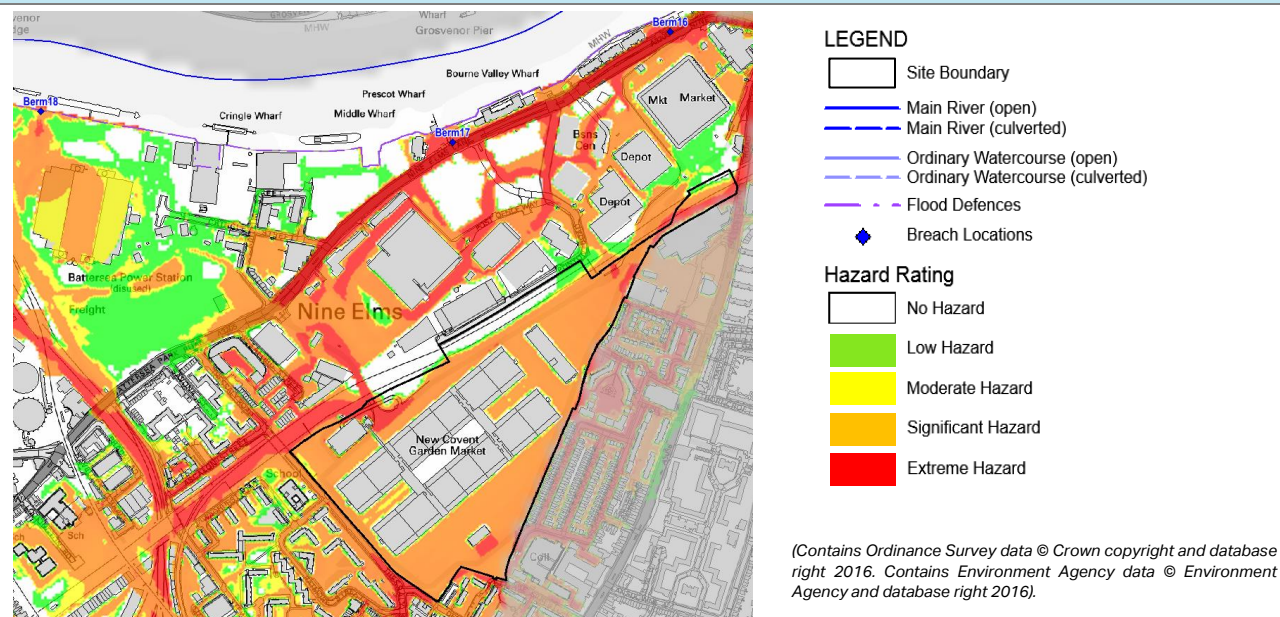
SITE 2.1.27: New Covent Garden Market, Main Market Area, Nine Elms, SW8

3) LEVEL 2 ASSESSMENT

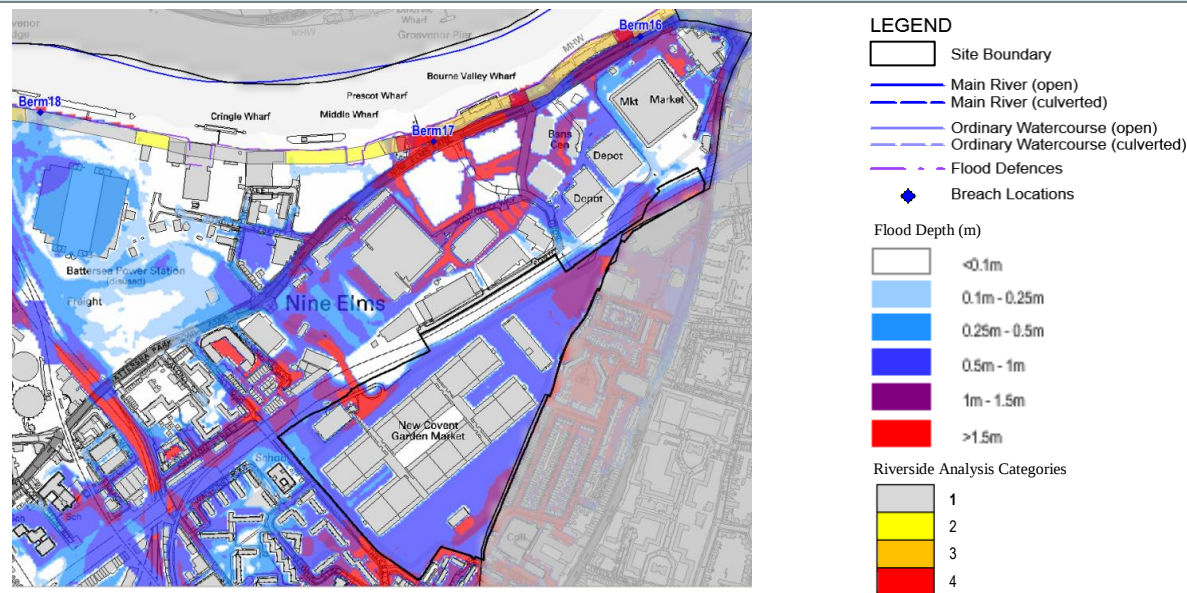
London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be both breach locations Berm16 and Berm17. For Berm16, the invert level was 4.18 and the width of the breach is 20 m. For Berm17, the invert level was 3.25 mAOD and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



Riverside Analysis

There are 3 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the majority of the frontage adjacent to the site as Category 2 and 4.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 4: Assumed Breach Level of <4.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) >1.0m.

SITE 2.1.27: New Covent Garden Market, Main Market Area, Nine Elms, SW8**4) RECOMMENDATIONS AND POLICIES**

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The entirety of the development site is within Flood Zone 3a of the River Thames and defended by the Thames Tidal Defence. For the current development site (without mitigation), the Thames Tidal breach modelling identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of 0.5-1m. Areas of existing development, and a discrete area to the north of the site are shown as being at risk of flooding to a depth of <0.1m. Under this scenario, the areas surrounding the current areas on site are shown as being at 'Significant Hazard'. There are small areas of Extreme Hazard to the north, west and south of the site. There are areas along the northern boundary that are shown to be at 'Low Hazard' and 'No Hazard'. More vulnerable development (such as residential uses) should be located in similar areas to current development and to the north of the site where areas of 'No Hazard' are apparent. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses should be located in areas of greater hazard i.e. to the north east. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses (such as commercial development), finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at high risk of surface water flooding and it is therefore recommended that consideration is given to the flow or surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.	Section 9.3
Safe Access/Egress	Access to the site is provided via Thessaly Road to the west of the site. However, Thessaly Road is shown as an area of 'Significant Hazard' and therefore in the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site. Carey Gardens Clubroom Rest Centre is also in close locality to the site.	Section 9.14
Surface Water Management	Current risk of flooding The site is located within Critical Drainage Area (CDA) Group7_028, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The potential development must not increase flood risk to other areas in the Drainage Catchment. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. There are no reported incidents of flooding held by Wandsworth Council in this location.	

SITE 2.1.27: New Covent Garden Market, Main Market Area, Nine Elms, SW8

	Indicative existing runoff rate: 80.4 l/s (1 in 1 year), 301.6 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 36.1 l/s	Section 10
	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site as SuDS feasibility is uncertain for some areas of the site. The site is located within a SPZ2. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m ² . Permeable paving ~ £30-50/m ² . Filter strips £2-4m ² . Detention basin £15-50m ³ . Concrete storage tank £449-518/m ³ .	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames, however it is defended by the Thames Tidal Defences. For this development site, more vulnerable development, such as residential, hotel and college uses, should be located to the north of the northern apex of the site, where areas of 'No Hazard' are apparent. The More Vulnerable uses must be located on the first floor or above. Less Vulnerable uses, such as restaurants, business and retail, should be located in areas of greater hazard and situated at ground level. In the event of a breach in the Thames Tidal Defence, there is potential that dry routes to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 2.1.28 : New Covent Garden Market, Flower Market, Nine Elms, SW8

1) PROPOSED DEVELOPMENT

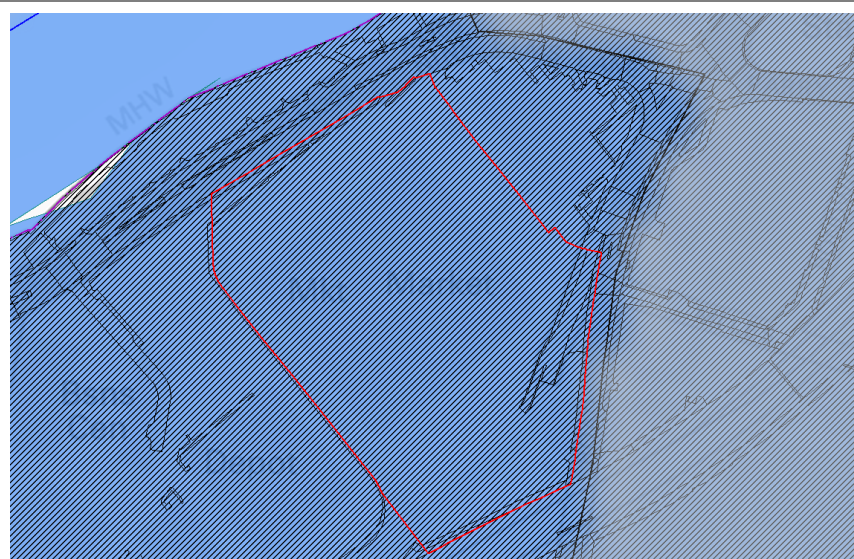
Site ID	2.1.28
Site Address	New Covent Garden Market, Flower Market, Nine Elms, SW8
Site Area	4.01 ha
Current Use	Flower market serving the whole of London.
Allocated Use	Residential-led mixed-use development including retail and office development and a GP facility with improved transport capacity and a new permeable network of streets and urban spaces including amenity space.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Thames.

<i>Proportion of potential development site within Flood Zone</i>	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0 %	100 %	0 %	0 %	100 %



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Zones**
- Flood Zone 1 Low Probability
- Flood Zone 2 Medium Probability
- Flood Zone 3a High Probability
- Flood Zone 3b Functional Floodplain
- Flood Defences
- Areas Benefiting from Flood Defences

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Flood risk from all other sources			Limitations
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (Level 1 SFRA Appendix A Figure 5.2 - uFMfSW)	High Risk 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (Level 1 SFRA Appendix A Figure 5.4 - BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

SITE 2.1.28 : New Covent Garden Market, Flower Market, Nine Elms, SW8

3) LEVEL 2 ASSESSMENT

London Borough of Wandsworth is located upstream of the Thames Barrier where tidal water levels are a function of the maximum tide level allowed through the Thames Barrier (defined by the barrier closure rule / matrix). As a result, when undertaking modelling of the Thames upstream of the Barrier typical return periods cannot be applied. For the purpose of this Level 2 site assessment, maximum flood depth and hazard mapping from the Environment Agency's updated River Thames breach modelling (2015) have been used, using the Maximum Likely Water Level (MLWL) under climate change conditions for the year 2100.

The mapping shows combined result for each of the breach scenarios. The worst case breach location for the site is considered to be breach location Berm16. The invert level was 4.18 and the width of the breach is 20 m.

Thames Tidal Breach Modelling: Maximum Hazard Rating (MLWL 2100)



LEGEND

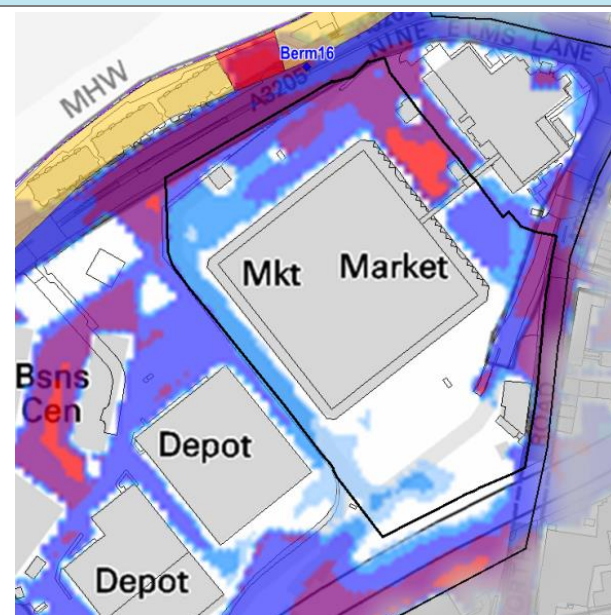
- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- Breach Locations

Hazard Rating

- No Hazard
- Low Hazard
- Moderate Hazard
- Significant Hazard
- Extreme Hazard

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Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



LEGEND

- Site Boundary
- Main River (open)
- Main River (culverted)
- Ordinary Watercourse (open)
- Ordinary Watercourse (culverted)
- Flood Defences
- Breach Locations

Flood Depth (m)

- <0.1m
- 0.1m - 0.25m
- 0.25m - 0.5m
- 0.5m - 1m
- 1m - 1.5m
- >1.5m

Riverside Analysis Categories

- 1
- 2
- 3
- 4

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Riverside Analysis

There are 3 breach locations in close proximity to the site which provides a good indication of the likely impact to the site. Results from the riverside analysis completed as part of the 2008 SFRA identify the majority of the frontage adjacent to the site as Category 2 and 4.

Category 2: Assumed Breach Level of 4.8 – 5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5m – 0m.

Category 4: Assumed Breach Level of <4.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) >1.0m.

SITE 2.1.28 : New Covent Garden Market, Flower Market, Nine Elms, SW8

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	A sequential approach to site layout should be used. The development site is entirely within Flood Zone 3a of the River Thames and Thames Tidal Defence system. For the current development site (without mitigation), the Thames Tidal breach modelling Berm16 identifies that under the MLWL 2100 scenario, the majority of the site is at risk of flood depths of <0.1m. To the north east of the site there is a risk of flooding >1.5m. Areas of existing development, and areas to the south of the site are shown as being at risk of flooding to a depth of <0.1m. Under this scenario, The site is highly varied in regards to the level of hazard across the site. In areas of current development, and across the majority of the southern area of the site there is 'No Hazard' or 'Low Hazard'. The northern extent of the site, along with the site boundaries to the east and west of the site are shown to be at 'Moderate Hazard' and 'Significant Hazard'. More vulnerable development should be located in similar areas to current development and to the south of the site where areas of 'No Hazard' are apparent. More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Less Vulnerable uses should be located in areas of greater hazard i.e. to the north east. Self-contained residential basements and bedrooms at basement level are not permitted in Flood Zone 3a or areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as plant, car parking etc, must provide safe internal access to higher floors situated above levels derived from the breach modelling. Further ground investigations would be required at this site to confirm the likelihood of groundwater occurrence. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
Finished Floor Levels	For More Vulnerable development, finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. For Less Vulnerable uses (such as commercial development), finished floor levels do not need to be raised with regards to policy, however, internal access must be provided to upper floors to provide safe refuge in a tidal breach flood event. There is no set guidance for the setting of finished floor levels of development in relation to surface water flood risk. The site is at high risk of surface water flooding and it is therefore recommended that consideration is given to the flow or surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.	Section 9.3
Safe Access/Egress	Access to the site is provided via Wandsworth Road to the south east of the site. However, Wandsworth Road is shown as an area of 'Significant Hazard' and therefore in the event of widespread flooding associated with a breach in the Tidal Thames Defence, a dry route to a refuge centre may not be apparent, it is therefore recommended that a Flood Warning and Evacuation Plan (FWEP) is developed, described further below.	Section 9.7
Flood Warning and Evacuation Plan	A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles. Flood Warning Areas The local area is covered by the Environment Agency Flood Warning Areas for 'Tidal Thames from Deptford Creek to Wandsworth Bridge'. Residents of the site should ensure they are signed up to the Environment Agency Flood Warning system. Emergency Rest Centres The closest designated emergency rest centre for this site is R.O.S.E. (Residents of Savona Estate), Ascalon Street, to the south of the development site.	Section 9.14
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 1, which is completely within London Borough of Wandsworth, and drains the Battersea and Nine Elms area. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. The potential development must not increase flood risk to other areas in the Drainage Catchment. There are no reported incidents of flooding held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 17.8 l/s (1 in 1 year), 66.9 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 8.0 l/s	

SITE 2.1.28 : New Covent Garden Market, Flower Market, Nine Elms, SW8

	SuDS Suitability Reference to the SWMP Appendix C2 Figure 4 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site as SuDS feasibility is uncertain for some areas of the site. The site is located within a SPZ2. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems	Section 10.3 and 10.9
	Drainage Strategy and Approvals Wandsworth Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6
	Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is located within Flood Zone 3a of the tidal River Thames and defended by the Thames Tidal Defences. For this development site, the most vulnerable development, such as the residential uses and GP facility should be located in areas of lowest hazard to the south of the site. The Less Vulnerable development, including retail and office uses, should be located in areas at high hazard of flooding. The More Vulnerable uses must be located on the first floor or above, with Less Vulnerable uses at ground level. Finished floor levels for habitable accommodation should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level. There is potential that dry routes to a safe place of refuge may be limited and it is therefore necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. The potential impacts of flooding should be mitigated through careful site layout, resilient construction techniques, and incorporation of SuDS, to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.