SITE 3.6 : Homebase, Swandon Way, SW18

1) PROPOSED DEVELOPMENT

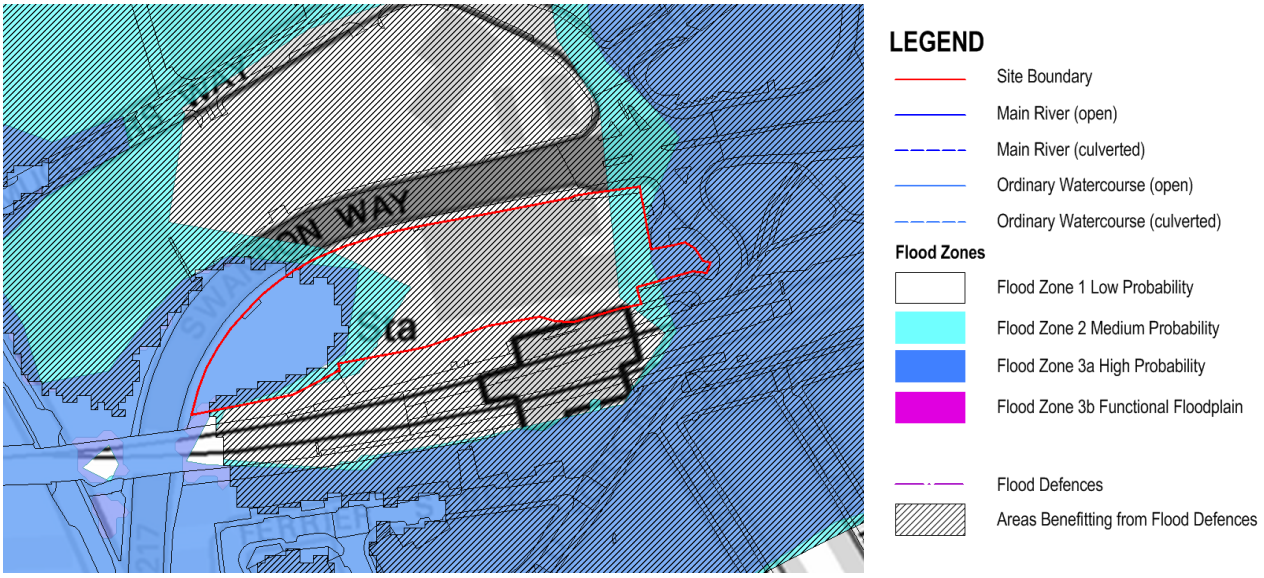
Site ID	3.6
Site Address	Homebase, Swandon Way, SW18
Site Area	0.96 ha
Current Use	A1 retail use.
Allocated Use	Residential development and improved access to the northern part of Wandsworth Town Station. The Council will seek to secure access to northern part of station as part of any development.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Wandle and the River Thames. The east of the site is Flood Zone 3a associated with the River Thames, and benefits from the Thames Tidal Defences. The west of the site is in Flood Zone 3a associated with the River Wandle.

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 %	**30%**	**16%**	**54%**	**79%**



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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)	**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	**3**	**0**	**3 Internal**	**0**	**0**

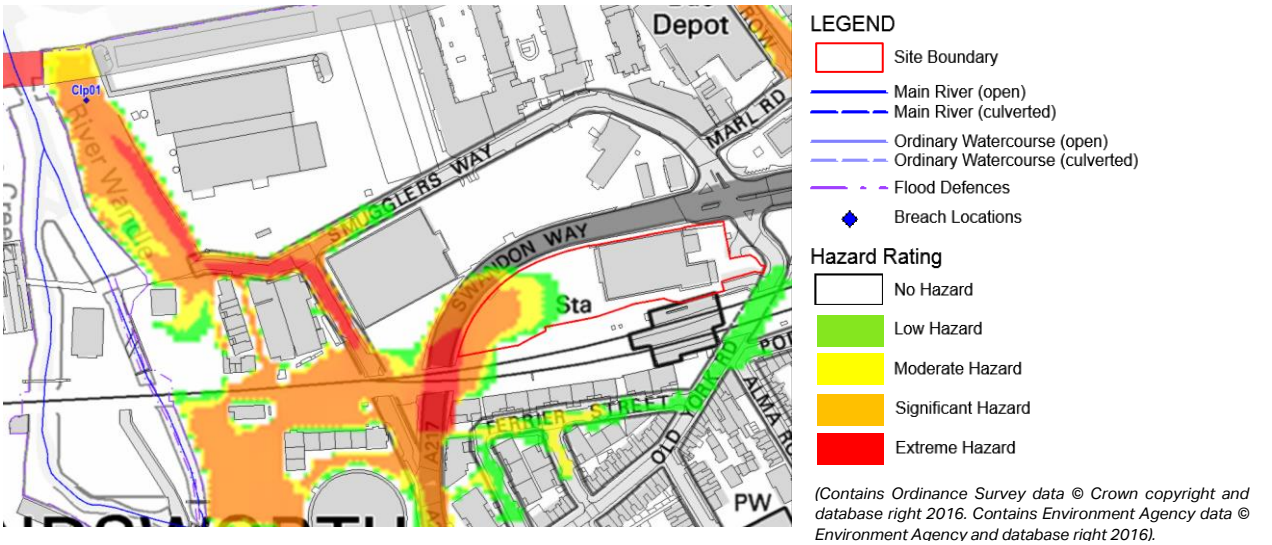
SITE 3.6 : Homebase, Swandon Way, SW18

3) LEVEL 2 ASSESSMENT

The 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 Clp 01. The invert level was 4.88 mAOD and the width of the breach is 20m.

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



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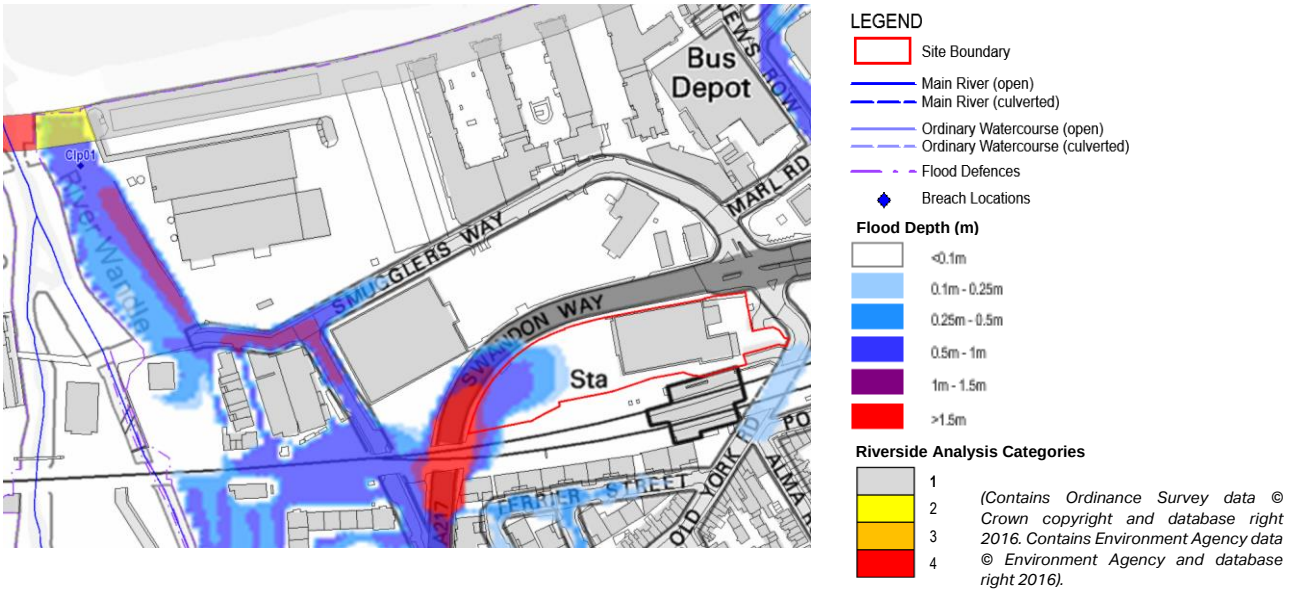
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

There is 1 breach location 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 1, which has an Assumed Breach Level of >5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0 m.

3b) LEVEL 2 ASSESSMENT – FLUVIAL RESIDUAL RISK

The site has been assessed against the fluvial hazard, depth and velocity outputs from the Environment Agency modelling of the River Wandle (2015) for the 1% AEP plus climate change event. During the 1% AEP plus climate change modelled flood event, floodwater is not shown to come out of bank of the River Wandle in this location and the site is not at risk of flooding. (Note that the modelling of the 1% AEP including Climate Change event includes the presence of flood defences along the course of the River Wandle).

SITE 3.6 : Homebase, Swandon Way, SW18		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The eastern half of the site is designated Flood Zone 1, with a small section of Flood Zones 2 and 3a associated with the River Thames at the eastern boundary, however the site is protected by the Thames Tidal Defences. The west of the site intersects Flood Zone 3a associated with the River Wandle. During the 1% AEP plus climate change modelled flood event, floodwater is not shown to come out of bank of the River Wandle in this location, however the Breach Modelling highlights that there is 'Significant Hazard' in the west of the site. The station is currently located where there is 'No Hazard'. All More Vulnerable residential development should be located in this area. Less Vulnerable uses should be located in the areas of greatest hazard, with More Vulnerable aspects of the build in the upper floors. 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 the current development site (without mitigation), the Thames Tidal breach modelling Clp01 identifies that under the MLWL 2100 scenario the site is at risk of flooding up to 1.5m in the west of the development site. The rest of the site has flood depths of <0.1m. 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 (i.e. the train station), 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 1% annual probability (1 in 100 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Swandon Way to the northwest of the site. In the event of widespread flooding associated with a breach in the Tidal Thames Defence, and for precautionary purposes, it is recommended that a Flood Warning and Evacuation Plan (FWEP) is developed.	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 Wandsworth Bridge to Putney 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 located within Critical Drainage Area (CDA) Group7_016, 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 2, which is completely within London Borough of Wandsworth, and drains much of Clapham Junction. 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 medium risk of surface water flooding. There are three incidents of surface water flooding recorded by Wandsworth Council in this location.	

SITE 3.6 : Homebase, Swandon Way, SW18

	Indicative existing runoff rate: 4.3 l/s (1 in 1 year), 16.1 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 currently unknown, and requires further assessment. 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/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"*.

The eastern half of the site is designated Flood Zone 1, with a small section of Flood Zones 2 and 3a associated with the River Thames at the eastern boundary, however the site is protected by the Thames Tidal Defences. The west of the site intersects Flood Zone 3a associated with the River Wandle. During the 1% AEP plus climate change modelled flood event, floodwater is not shown to come out of bank of the River Wandle in this location, however there is a residual risk of flooding from a potential breach in the Thames Defences. More Vulnerable residential development, should be located in Flood Zone 1 towards the centre of the site.. Finished flood levels in the area must be raised and it is recommended that flood resistant measures are utilised for flood depths up to 0.6m, with flood resilient techniques employed thereafter. SuDS should be incorporated into building design to reduce the risk of transfers flood risk to the surrounding area. 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. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 3.7 : B&Q, Smugglers Way, SW18

1) PROPOSED DEVELOPMENT

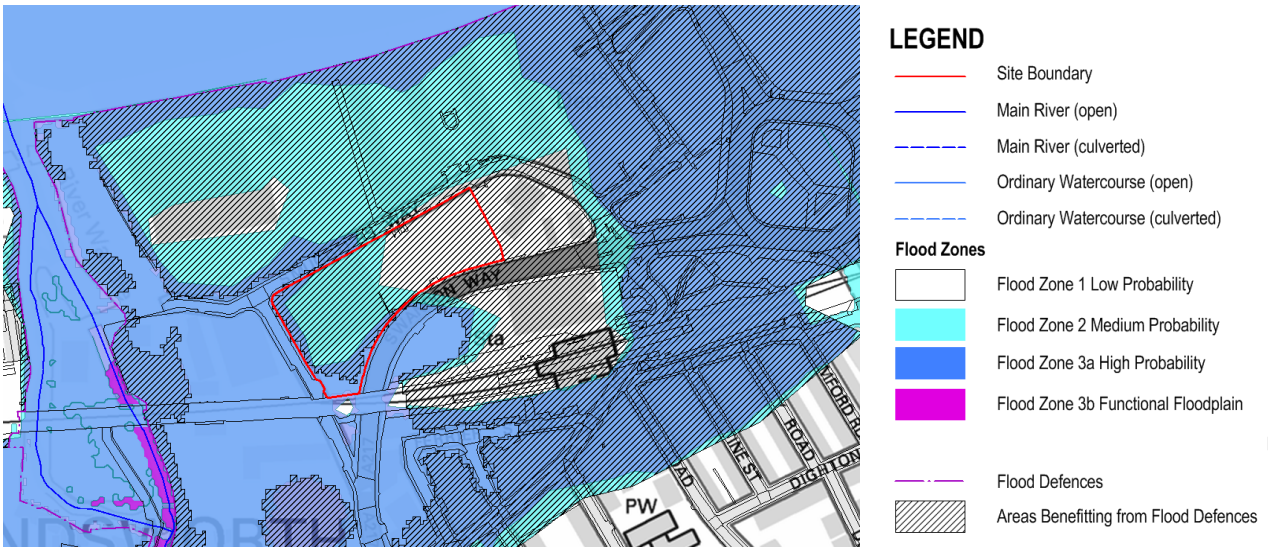
Site ID	3.7
Site Address	B&Q, Smugglers Way, SW18
Site Area	1.42 ha.
Current Use	A1 retail use.
Allocated Use	Residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is in close proximity to the River Wandle and the River Thames. The north and east of the site is Flood Zone 1, 2 and 3a associated with the River Thames, and benefits from the Thames Tidal Defences. The south of the site is in Flood Zone 3a associated with the River Wandle.

	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
Proportion of potential development site within Flood Zone	**0 %**	**17 %**	**42 %**	**41 %**	**94 %**



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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)	**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

	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
Historic records of flooding from each source within a 100m radius of potential development site	**0**	**2**	**0**	**3 Internal**	**0**	**0**

SITE 3.7 : B&Q, Smugglers Way, SW18

3a) LEVEL 2 ASSESSMENT – TIDAL RESIDUAL RISK

The 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 Clp 01. The invert level was 4.88 mAOD and the width of the breach is 20m.

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

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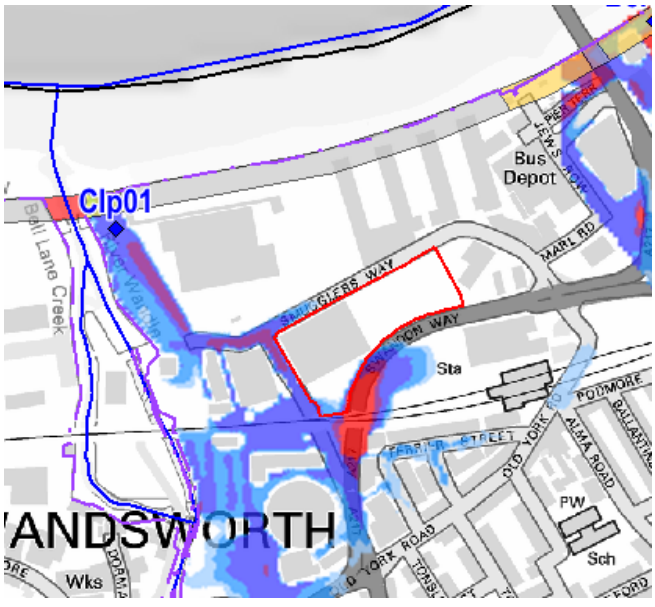
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

There is 1 breach location 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 a Category 1, which has an Assumed Breach Level of >5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0m.

3b) LEVEL 2 ASSESSMENT – FLUVIAL RESIDUAL RISK

The site has been assessed against the fluvial hazard, depth and velocity outputs from the Environment Agency modelling of the River Wandle (2015) for the 1% AEP plus climate change event. During the 1% AEP plus climate change modelled flood event, floodwater is not shown to come out of bank of the River Wandle in this location and the site is not at risk of flooding. (Note that the modelling of the 1% AEP including Climate Change event includes the presence of flood defences along the course of the River Wandle)

SITE 3.7 : B&Q, Smugglers Way, SW18		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The western half of the site is within Flood Zone 2 associated with the River Thames, with a small section of Flood Zone 3a around the western border, however the site is protected by the Thames Tidal Defences. The eastern half of the site is designated Flood Zone 1.There is a small area of the site at the southern boundary that is within Flood Zone 3a associated with the River Wandle. During the 1% AEP plus climate change modelled flood event, floodwater is not shown to come out of bank of the River Wandle in this location, however the Breach Modelling highlights that there is 'Moderate' to 'Low' hazard in the south of the site and flood depths up to 0.5m. For the current development site (without mitigation), the Thames Tidal breach modelling (at breach location CLP01) identifies that under the MLWL 2100 scenario the majority of the site is classified as 'No Hazard'. However, the roads to the south and west of the site are classified as 'Extreme Hazard', therefore the More Vulnerable elements of the proposed development should be located in areas to the east of the site and set back from the potentially hazardous roads. 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 the current development site (without mitigation), the Thames Tidal breach modelling Clp01 identifies that under the MLWL 2100 scenario the site border in the south is at risk of flooding up to 1m. The rest of the site is at risk of flooding <0.1m. For More Vulnerable development, finished floor levels 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 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 1% annual probability (1 in 100 year) surface water flood event.	Section 9.3
Flood Resistance	It is recommended that flood resistant construction methods should be considered where flood risk depth is less than 0.6m. These techniques are aimed at keeping the water out, which can be achieved by using appropriate construction materials with a low permeability, raising property thresholds and using landscaping to manage surface water and fluvial floodwater.	Section 9.4
Flood Resilience	In the southern area, where flood depths could be over 0.6m1, the strategy should be to allow water into the building, but to implement careful design in order to minimise damage and allow rapid re-occupancy. For example, concrete flooring and waterproofing building materials such as timber joists and render and flood resilient air brick covers.	Section 9.5
Safe Access/Egress	Access to the site is provided via Smugglers Way or Swandon Way to the north and south of the site. In the event of widespread flooding, 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.	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 'River Wandle and Wandsworth'. 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 the Lola Jones Hall and Tooting Leisure Centre, both within the London Borough of Wandsworth.	Section 9.14

[1] Department for Communities and Local Government (2007) Improving the flood performance of new buildings, Flood resilient construction.

SITE 3.7 : B&Q, Smugglers Way, SW18

Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_016, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The uFMfSW indicates that the site and surrounding area is at medium risk of surface water flooding. The site is within Drainage Catchment 2, which is completely within London Borough of Wandsworth, and drains much of Clapham Junction. The potential development must not increase flood risk to other areas in the Drainage Catchment.	
	Indicative existing runoff rate: 6.3 l/s (1 in 1 year), 23.7 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 currently unknown, and requires further assessment. 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/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"*.

The proposed use for this site is residential and should be allocated within areas of Flood Zone 1. Although the main area of the site is defined as 'No Hazard', the surrounding roads experience 'Extreme Hazard' under the Tidal Breach scenario. On this basis all development should be set back from the road edge, finished floor levels may need to be increased and the use of appropriate resistant or resilient measures should be considered. 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. SuDS should be incorporated where possible 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 3.8 : McDonalds, Swandon Way, SW18

1) PROPOSED DEVELOPMENT

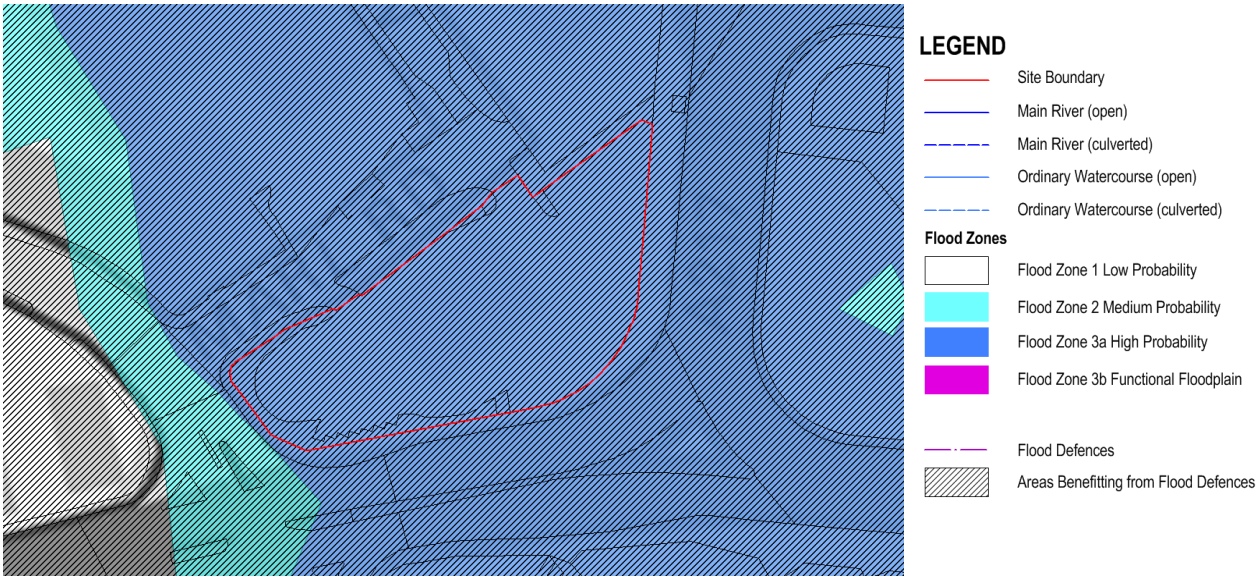
Site ID	3.8
Site Address	McDonalds, Swandon Way, SW18
Site Area	0.34 ha
Current Use	McDonald's Hot Food Takeaway.
Allocated Use	Scope for intensification, including development above the car park for a mix of uses including residential.
Vulnerability	More vulnerable (residential)

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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)	**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)	**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**	**3 Internal**	**0**	**0**

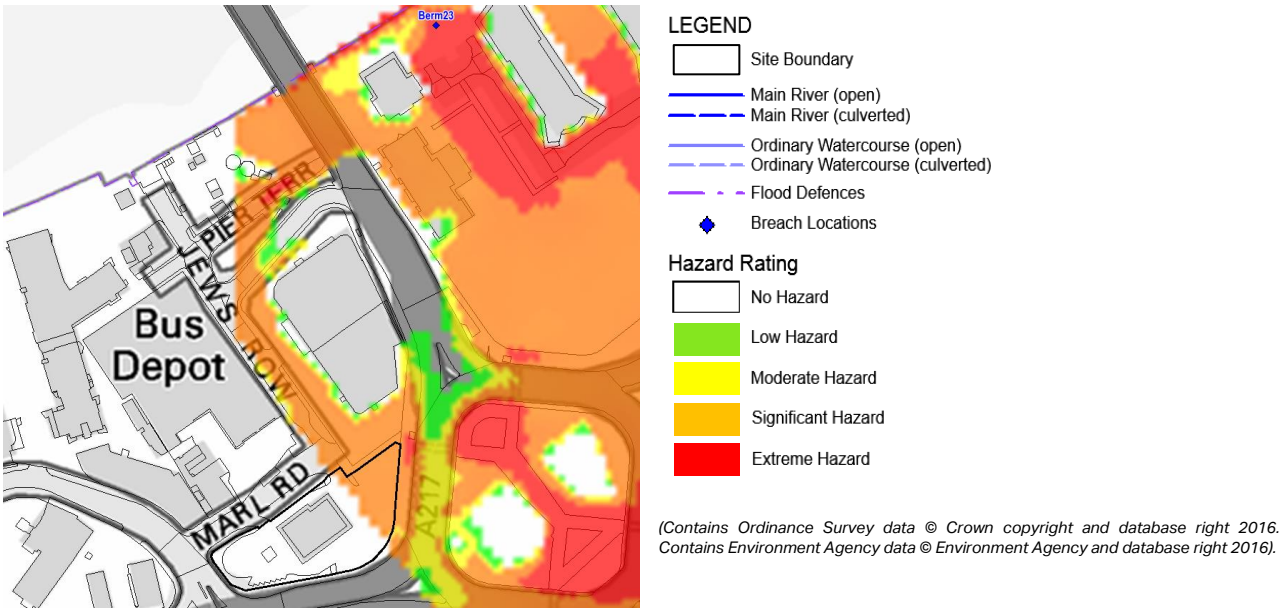
SITE 3.8 : McDonalds, Swandon Way, SW18

3) LEVEL 2 ASSESSMENT

The 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 Berm23. The invert level was 3.87 and the width of the breach is 20m.

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



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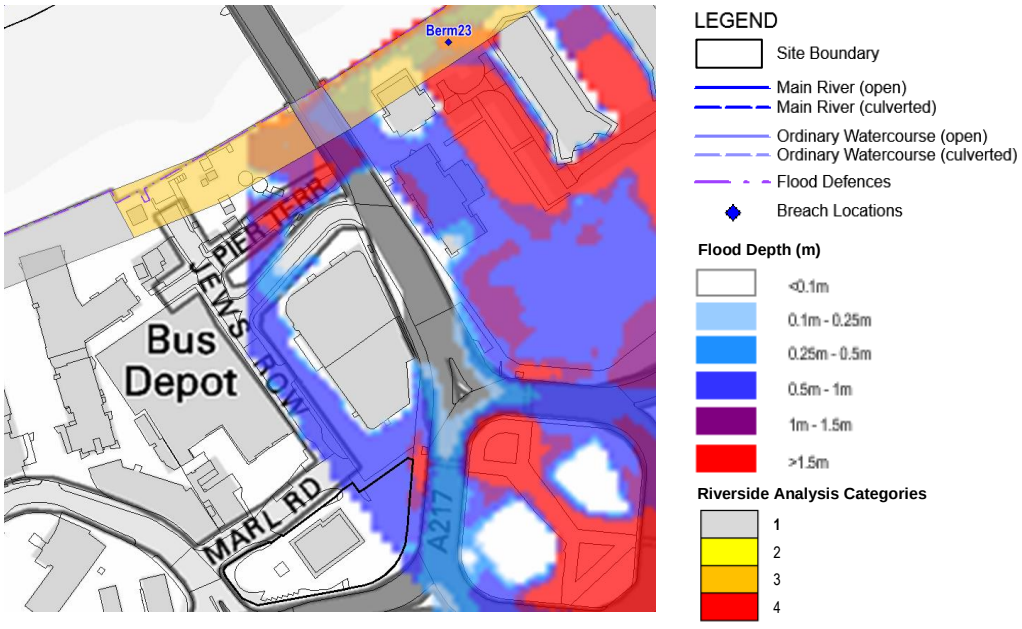
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

There is 1 breach location 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 1, which has an Assumed Breach Level of >5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0 m.

Category 3, which has an Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5 m – 1 m.

SITE 3.8 : McDonalds, Swandon Way, SW18		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The site is entirely within the defended Flood Zone 3a of the River Thames. The Tidal Breach Modelling indicates that the eastern side of the site is at 'Significant Hazard'. The More Vulnerable (residential) elements of the proposal should be located away from here in areas which are at 'No Hazard'. 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 the current development site (without mitigation), the Thames Tidal breach modelling Berm23 identifies that under the MLWL 2100 scenario the site is at risk of flooding up to 1m in the east of the development site. The rest of the site has flood depths of <0.1m. 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 (i.e. McDonalds), 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 1% annual probability (1 in 100 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Marl Road to the west of the site. In the event of widespread flooding associated with the River Wandle, 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.	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 Wandsworth Bridge to Putney 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 the Lola Jones Hall and Tooting Leisure Centre, both within the London Borough of Wandsworth.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_016, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The uFMfSW indicates that the site and surrounding area is at medium risk of surface water flooding. The site is within Drainage Catchment 2, which is completely within London Borough of Wandsworth, and drains much of Clapham Junction. The potential development must not increase flood risk to other areas in the Drainage Catchment.	
	Indicative existing runoff rate: 1.5 l/s (1 in 1 year), 5.6 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 potentially unsuitable for the site. This will need to be confirmed 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

SITE 3.8 : McDonalds, Swandon Way, SW18

	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 entirely within Flood Zone 3a of the River Thames but is protected by the Thames Tidal Defence System. The residual flood risk to the site in the event of a breach in the tidal defences identifies an area of significant hazard to the east of the site. More vulnerable (residential) development must be located away from here. Furthermore, finished floor levels must be raised for this development. Flood resilient techniques are recommended in areas where flood depth is over 0.6m. 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. SuDS should be incorporated where possible 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 3.9 : Mercedes Benz and Bemco, Bridgend Road, SW18

1) PROPOSED DEVELOPMENT

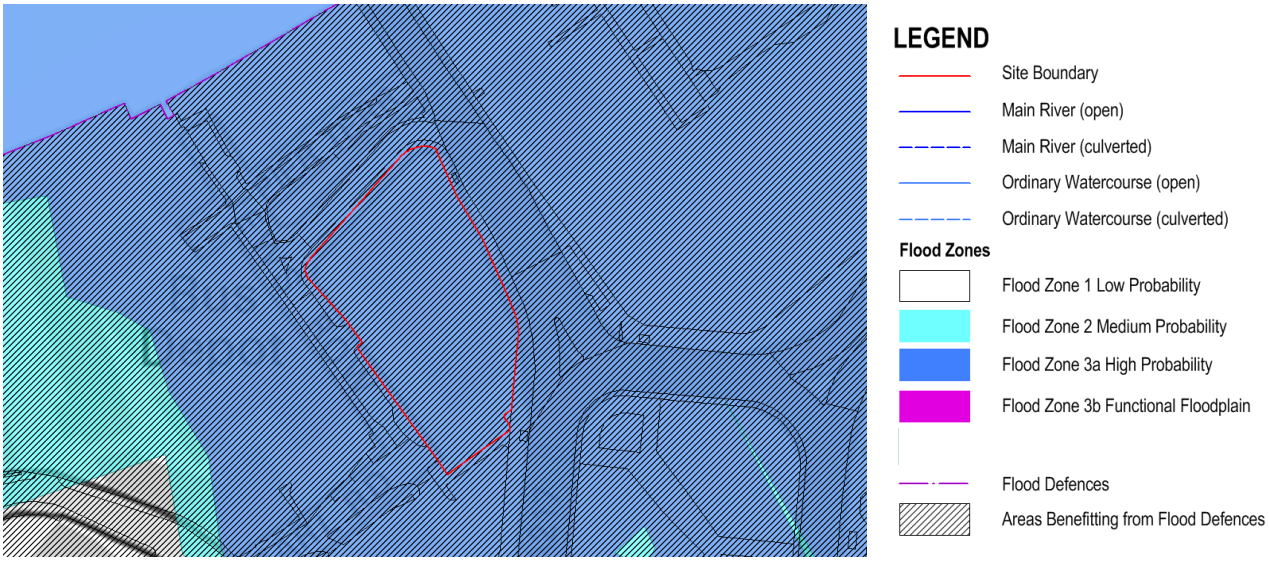
Site ID	3.9
Site Address	Mercedes Benz and Bemco, Bridgend Road, SW18
Site Area	0.58 ha
Current Use	Sui Generis, B8 Storage or Distribution, A1 retail.
Allocated Use	Mixed use development including residential, incorporating replacement B1, B8 or related SG use.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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)	**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)	**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**	**3 Internal**	**0**	**0**

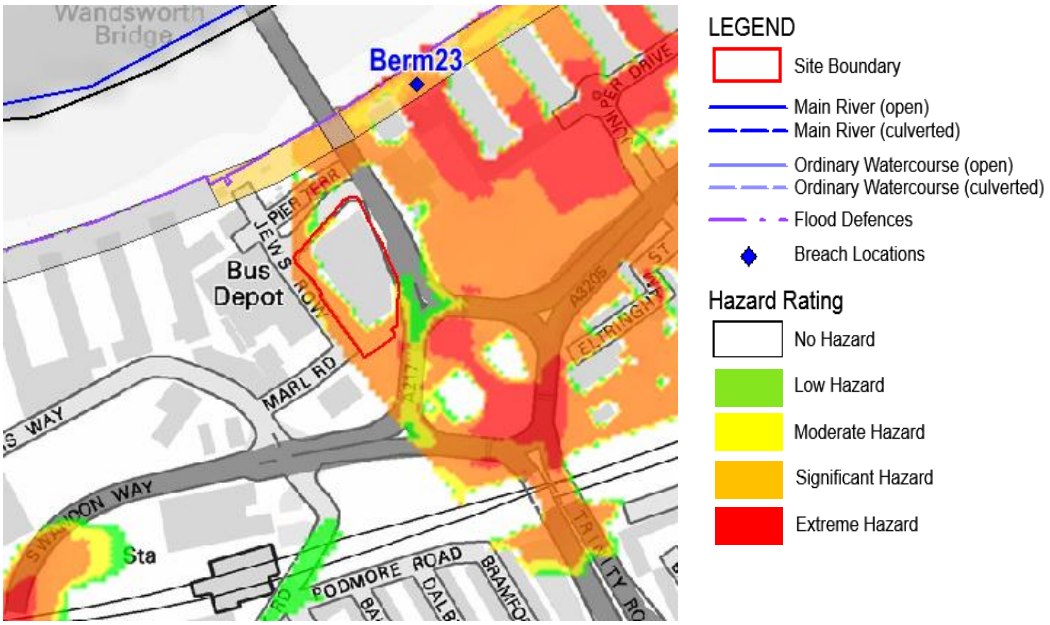
SITE 3.9 : Mercedes Benz and Bemco, Bridgend Road, SW18

3) LEVEL 2 ASSESSMENT

The 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 Berm23. The invert level was 3.87 and the width of the breach is 20m.

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



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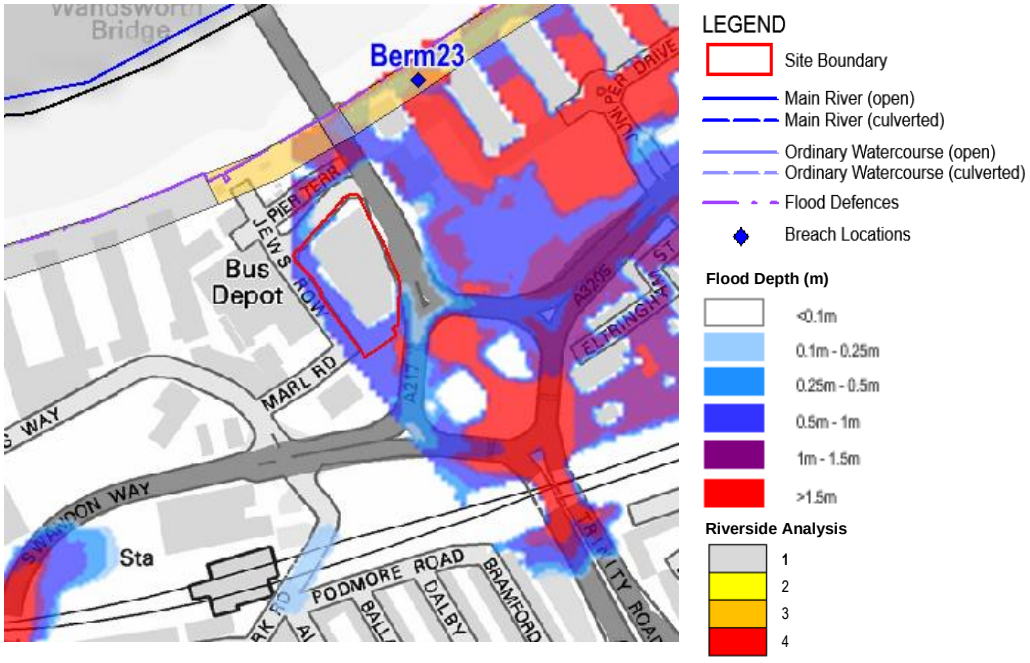
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

The Riverside Analysis shows that there is 1 breach location 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 a Category 3, which has an Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5 m – 1 m.

SITE 3.9 : Mercedes Benz and Bemco, Bridgend Road, SW18		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The development site is completely within defended Flood Zone 3a of the River Thames. The Tidal Breach hazard mapping highlights that the western site boundary is classified as 'Significant Hazard' in the event of a breach at Berm23. The More Vulnerable residential components of the development should be located away from this location, within areas classed as 'No Hazard'. 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 the current development site (without mitigation), the Thames Tidal breach modelling Berm23 identifies that under the MLWL 2100 scenario the site border in the west and south is at risk of flooding up to 1m. The rest of the site is at risk of flooding <0.1m. The proposed development is residential and 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. Therefore the majority of the site is unlikely to require amendments for finished floor level. If residential development is required in the high risk area then finished floor levels must be raised. 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 1% annual probability (1 in 100 year) surface water flood event.	Section 9.3
Safe Access/Egress	Access to the site is provided via Marl Road to the north and south of the site. In the event of widespread flooding associated with the River Wandle, 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.	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 Wandsworth Bridge to Putney 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 the York Gardens Library, approximately 800m northeast.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_016, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The uFMfSW indicates that the site and surrounding area is at medium risk of surface water flooding. The site is within Drainage Catchment 2, which is completely within London Borough of Wandsworth, and drains much of Clapham Junction. The potential development must not increase flood risk to other areas in the Drainage Catchment.	
	Indicative existing runoff rate: 2.6 l/s (1 in 1 year), 9.7 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 potentially unsuitable for the site. There are also areas which will require further assessment through site visits as suitability is currently unknown. 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

SITE 3.9 : Mercedes Benz and Bemco, Bridgend Road, SW18

	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 mixed-use site is entirely within the Flood Zone 3a of the River Thames, however it is protected by the Thames Tidal Defences. The More Vulnerable aspects of the development should be located away from the south western edge which is at Significant Hazard. Finished floor levels would need to be raised for any More Vulnerable development built at this location. Flood resistant resilient measures should be considered where appropriate. 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. SuDS should be incorporated where possible 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 3.10: Wandsworth Bridge Roundabout, SW18

1) PROPOSED DEVELOPMENT

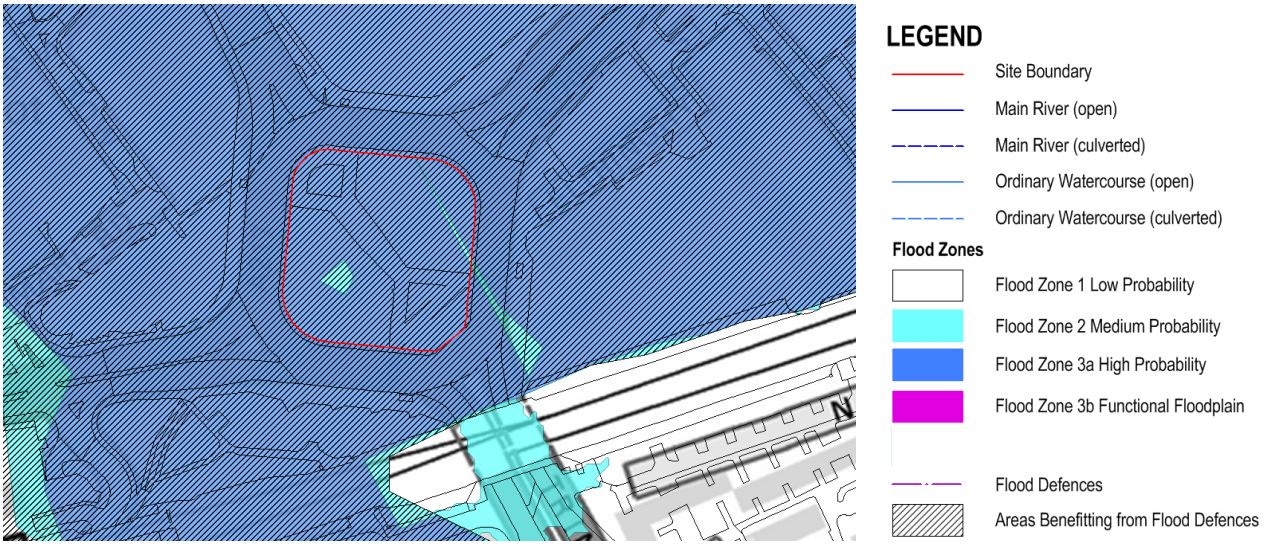
Site ID	3.10
Site Address	Wandsworth Bridge Roundabout, SW18
Site Area	0.7 ha
Current Use	Pedestrian underpass which forms the roundabout.
Allocated Use	Mixed use development including residential.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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 %	**97 %**	**3 %**	**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 (3.3% 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**	**3 Internal**	**0**	**0**

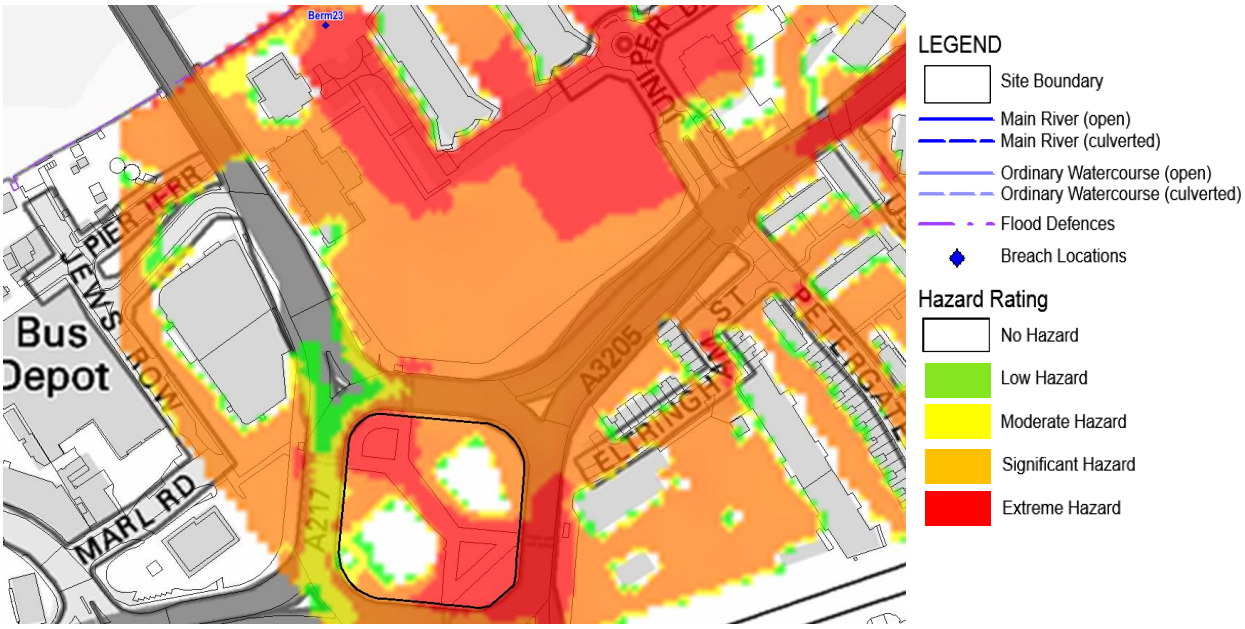
SITE 3.10: Wandsworth Bridge Roundabout, SW18

3) LEVEL 2 ASSESSMENT

The 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 Berm23. The invert level was 3.87 and the width of the breach is 20m.

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



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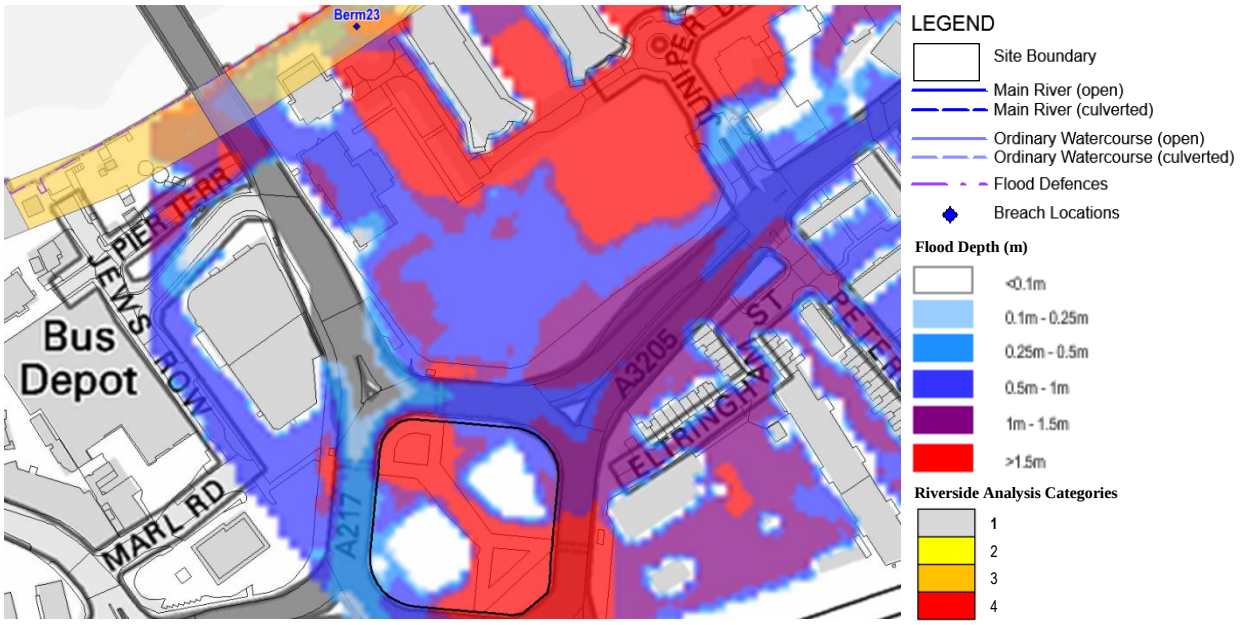
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

The Riverside Analysis shows that there is 1 breach location 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 a Category 3, which has an Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5 m – 1 m.

SITE 3.10: Wandsworth Bridge Roundabout, SW18		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The site is almost entirely with the Flood Zone 3a of the River Thames, however it benefits from the Thames Tidal Defences. Based on the Thames Tidal Breach modelling there is 'Extreme Hazard' along the current pedestrian underpass, 'Significant Hazard' surrounding this and two areas in the centre defined as 'No hazard'. The proposed site use consists of mixed vulnerability, it is therefore essential that the most vulnerable elements (i.e. residential) are located in the areas identified as 'No Hazard'. 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 basement uses may be allocated anywhere, however, it is advised that basements are not located where the underpass is at "Extreme Hazard". Any basement development 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. The site is at high surface water risk, therefore 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 the current development site (without mitigation), the Thames Tidal breach modelling Berm23 identifies that under the MLWL 2100 scenario the pedestrian underpass is at risk of flooding >1.5m. Areas surrounding this are at risk of flooding between 0.5-1.5m. The two central areas that are at 'No hazard' are at risk of flooding <0.1m. The proposed development is mixed, therefore the More Vulnerable residential elements should be set at or above the Thames Tidal breach modelling MLWL 2100 scenario flood level if it is to be located in areas of greater flood risk. 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 3.33% annual probability (1 in 30 year) surface water flood event.	Section 9.3
Safe Access/Egress	In the event of a Tidal Defence Breach the safest access to the site is provided via Swandon Way to the west of the site. It is necessary to prepare a Flood Warning and Evacuation Plan (FWEP), 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 the York Gardens Library, approximately 700m northeast.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_016, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The uFMfSW indicates that the site and surrounding area is at high risk of surface water flooding. The site is within Drainage Catchment 2, which is completely within London Borough of Wandsworth, and drains much of Clapham Junction. The potential development must not increase flood risk to other areas in the Drainage Catchment.	
	Indicative existing runoff rate: 3.1 l/s (1 in 1 year), 11.7 l/s (1 in 100 year) **Indicative Greenfield Runoff Rate:** 5 l/s	Section 10

SITE 3.10: Wandsworth Bridge Roundabout, SW18

	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/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 mixed-use site is entirely within the Flood Zone 3a of the River Thames, however the site is protected by the Thames Tidal Defences. The More Vulnerable aspects of the development should be located in the two central areas which are at 'No Hazard'. Due to the severity of flood hazard in the former pedestrian underpass it is essential to ensure that any basements are for Less Vulnerable use only and there is an established access to higher floors. Where possible flood resistant and resilient measures should be applied. 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. SuDS should be incorporated where possible 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 3.11 : Wandsworth Bus Garage, Jews Row, SW18

1) PROPOSED DEVELOPMENT

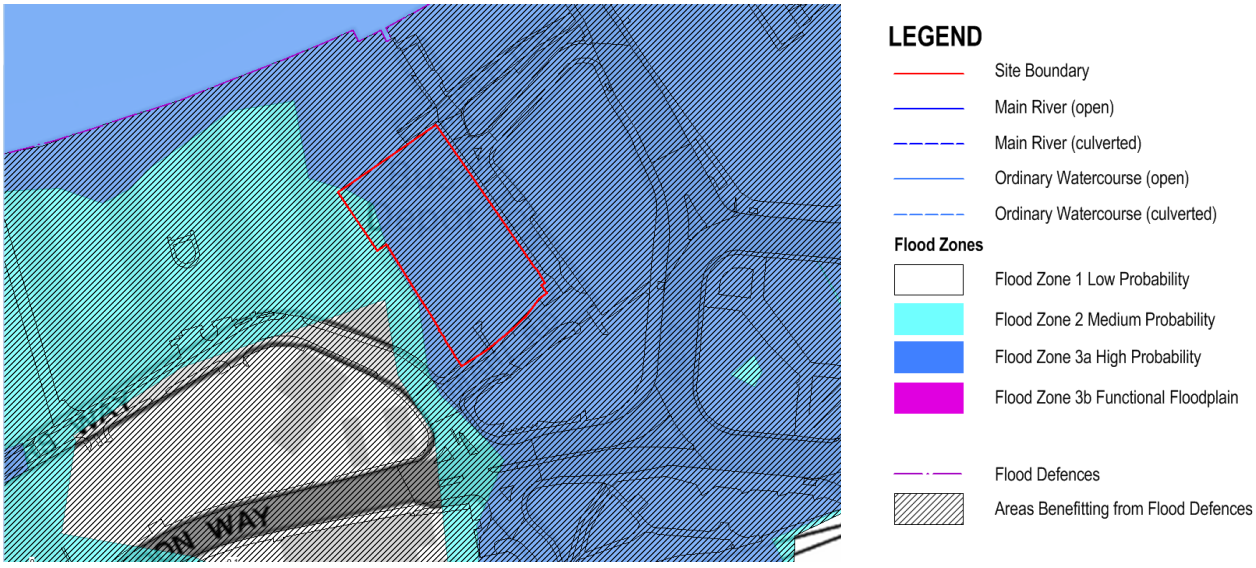
Site ID	3.11
Site Address	Wandsworth Bus Garage, Jews Row, SW18
Site Area	0.6 ha
Current Use	Bus garage.
Allocated Use	Mixed use with residential development may be considered if a suitable alternative site for the bus garage could be provided. Alternatively, if it can be demonstrated that the requirements of the existing transport use remain unaffected, some residential development may be considered appropriate above the transport use.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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 %	**95%**	**5%**	**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)	**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)	**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**	**3 Internal**	**0**	**0**

SITE 3.11 : Wandsworth Bus Garage, Jews Row, SW18

3) LEVEL 2 ASSESSMENT

The 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 Berm23. The invert level was 3.87 and the width of the breach is 20m.

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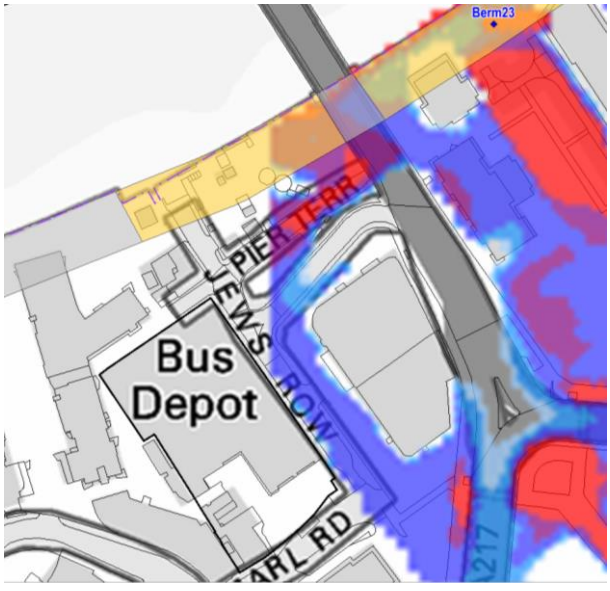
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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

The Riverside Analysis shows that there is 1 breach location 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 1, which has an Assumed Breach Level of >5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0 m.

Category 3, which has an Assumed Breach Level of 4.3-4.8 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5 m – 1 m.

SITE 3.11 : Wandsworth Bus Garage, Jews Row, SW18		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The site is almost entirely with the undefended Flood Zone 3a of the River Thames. The Thames Tidal Breach Modelling shows that the site is not directly intersecting with the hazard map, however, its eastern boundary is adjacent to an area of 'Significant Hazard'. The proposed site use consists of mixed vulnerability; it is recommended that the most vulnerable aspects of the development are built away from the Significant Hazard area. 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 basement uses may be allocated anywhere, however, any basement development 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.	Section 9.2
Finished Floor Levels	For the current development site (without mitigation), the site is not impacted by the Thames Tidal breach modelling at breach location Berm23 under the MLWL 2100 scenario. However the Riverside Analysis identifies the River frontage to the northeast of the site is Category 3 with a potential peak depth of 0.5m-1m. The proposed development is mixed, therefore the More Vulnerable residential elements should be set at or above Riverside Analysis Category 3 potential peak depth of 0.5m-1m. 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 3.33% annual probability (1 in 30 year) surface water flood event.	Section 9.3
Safe Access/Egress	In the event of a Tidal Defence Breach the safest access to the site is provided via Marl Road to the west of the site. It is necessary to prepare a Flood Warning and Evacuation Plan (FWEP), 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 Wandsworth Bridge to Putney 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 the York Gardens Library, approximately 800m northeast.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_016, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The uFMfSW indicates that the site and surrounding area is at medium risk of surface water flooding. The site is within Drainage Catchment 2, which is completely within London Borough of Wandsworth, and drains much of Clapham Junction. The potential development must not increase flood risk to other areas in the Drainage Catchment.	
	Indicative existing runoff rate: 2.6 l/s (1 in 1 year), 9.9 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 unknown for the site and requires further investigation. 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

SITE 3.11 : Wandsworth Bus Garage, Jews Row, SW18

	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 mixed-use site is almost entirely within the defended Flood Zone 3a of the River Thames. The site does not intersect the Thames Tidal Breach hazard, however, there is significant risk in the surrounding area. 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. SuDS should be incorporated where possible 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 4.1.2 : Clapham Junction Station Approach, SW11

1) PROPOSED DEVELOPMENT

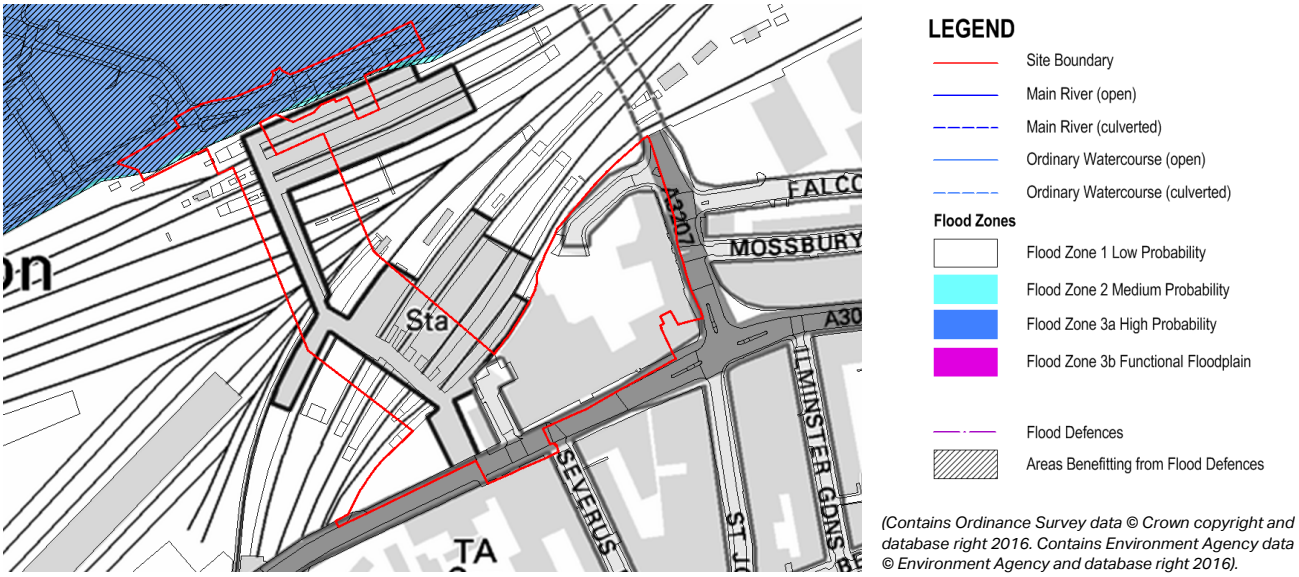
Site ID	4.1.2
Site Address	Clapham Junction Station Approach, SW11
Site Area	3.39 ha
Current Use	Clapham Junction Railway Station.
Allocated Use	Safeguarding of the station and railway sidings for transport use. Improvements to Clapham Junction Station, including improved access arrangements. Proposals to straighten platforms 15-17 to allow increased passenger capacity and provide safer access to trains. Development to provide enhanced retail to strengthen its shopping function and high density residential above. Other appropriate uses including business, hotel, culture, leisure and entertainment.
Vulnerability	More vulnerable (residential), Less Vulnerable (commercial)

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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 %	**10%**	**1%**	**89%**	**11%**



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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)	**High Risk** Potential for groundwater flooding to occur at surface and 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	**2**	**1**	**2 Internal 1 External**	**0**	**0**

SITE 4.1.2 : Clapham Junction Station Approach, SW11

3) LEVEL 2 ASSESSMENT

The 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 Berm22. The invert level was 4.66 mAOD and the width of the breach is 20m.

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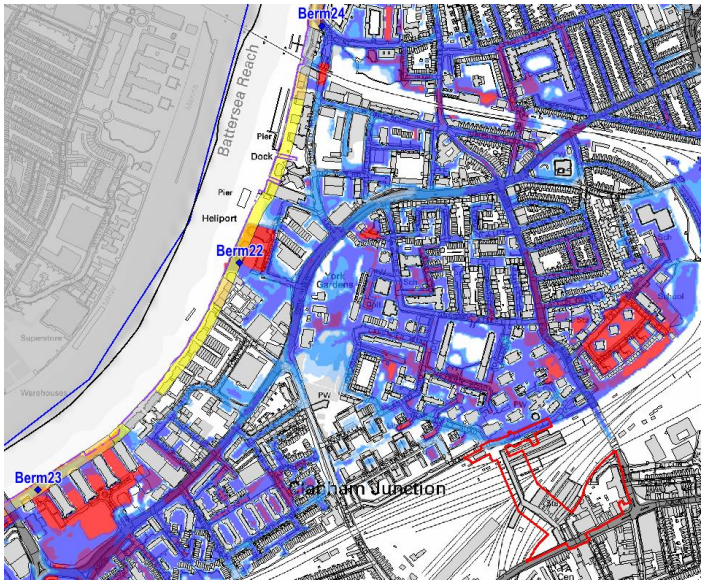
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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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

Riverside Analysis

The Riverside Analysis shows that there is 1 breach location 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, which has an Assumed Breach Level of 4.8-5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5-0m.

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

SITE 4.1.2 : Clapham Junction Station Approach, SW11		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The majority of the site is within Flood Zone 1, however the northern boundary intersects the defended Flood Zone 3a of the River Thames. The Thames Tidal Breach modelling hazard map shows the northern boundary to be with the 'Significant Hazard' category. Therefore new development should be located towards the southern area of the site. There is one historic record of groundwater flooding held by Wandsworth Council within 100m of this site. Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Due to a high risk of groundwater flooding, it is recommended that Low Vulnerable basements are also not permitted at this site.	Section 9.2
Finished Floor Levels	For the current development site (without mitigation), the Thames Tidal breach modelling Berm22 identifies that under the MLWL 2100 scenario the northern site boundary is at risk of flooding to 1m. 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 (i.e. the train station), 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.	Section 9.3
Safe Access/Egress	In the event of a Tidal Defence Breach the safest access to the site is provided via Grant Road to the west of the site. It is necessary to prepare a Flood Warning and Evacuation Plan (FWEP), 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 the York Gardens Library, approximately 500m northeast.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_022, 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 10, which is split between the London Boroughs of Wandsworth and Lambeth. The uFMfSW indicates that the site and surrounding area is at high risk of surface water flooding. There are two reported internal sewer incidents of flooding held by Wandsworth Council in this location and one external.	
	Indicative existing runoff rate: 15.1 l/s (1 in 1 year), 56.5 l/s (1 in 100 year) **Indicative Greenfield Runoff Rate:** 6.8 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. 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

SITE 4.1.2 : Clapham Junction Station Approach, SW11

	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"*.

The proposed development for this site is the re-development of Clapham Junction train station. The majority of the site is in Flood Zone 1 therefore new development should be located here. Any development that must be located in the areas at greatest hazard should consider flood resistant or resilient measures. 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. SuDS should be incorporated where possible 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 4.1.3 : Land on the corner of Grant Road and Falcon Road, SW11

1) PROPOSED DEVELOPMENT

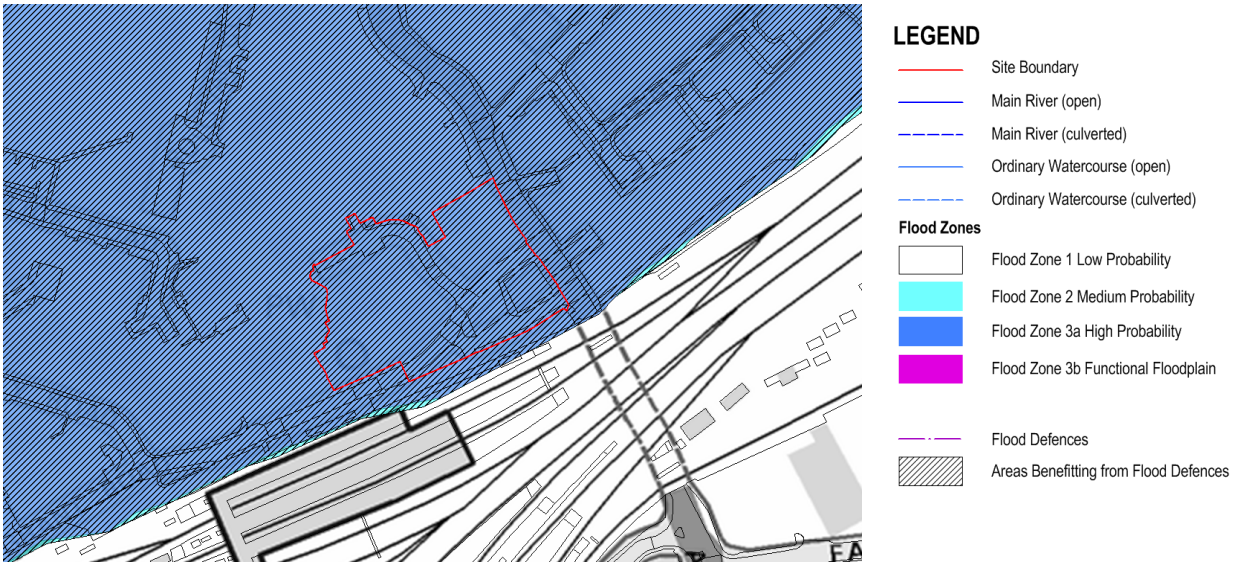
Site ID	4.1.3
Site Address	Land on the corner of Grant Road and Falcon Road, SW11
Site Area	0.9 ha
Current Use	Mixed-use development with commercial use to ground floor, residential use and ecclesiastical use.
Allocated Use	Mixed use development including residential. Town centre uses should be located on the southern half of the site, as the northern half is outside the town centre boundary and will be more suitable to residential use.
Vulnerability	More vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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)	**High Risk** Potential for groundwater flooding to occur at surface and 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	**3**	**1**	**16 Internal**	**0**	**0**

SITE 4.1.3 : Land on the corner of Grant Road and Falcon Road, SW11

3) LEVEL 2 ASSESSMENT

The 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 Berm22. The invert level was 4.66 mAOD and the width of the breach is 20m.

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

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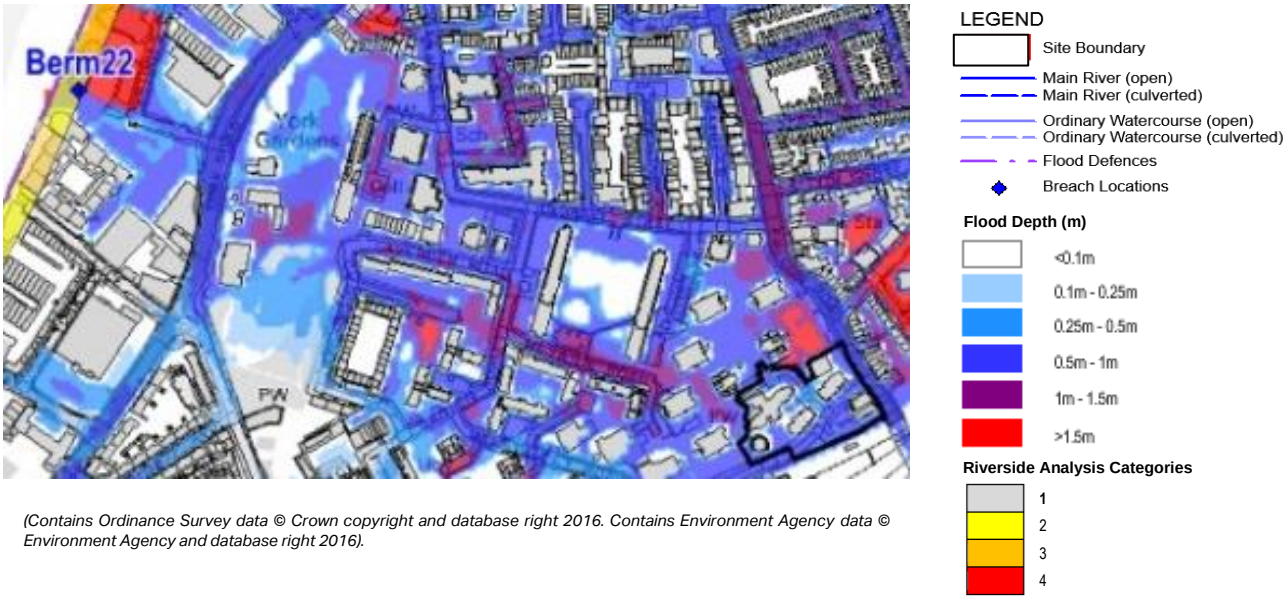
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

The Riverside Analysis shows that there is 1 breach location 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, which has an Assumed Breach Level of 4.8-5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5-0m.

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

SITE 4.1.3 : Land on the corner of Grant Road and Falcon Road, SW11		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The site is entirely within the defended Flood Zone 3a of the River Thames. The Thames Tidal Breach modelling highlights that surrounding the current development there are areas of 'Significant Hazard'. The area of 'Significant Hazard' is greater towards the south of the site. The More Vulnerable residential uses should be allocated to the north where previous development is at 'No Hazard'. The Less Vulnerable commercial town centre uses should be located in the south. There is one historic record of groundwater flooding held by Wandsworth Council within 100m of this site. Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Due to a high risk of groundwater flooding, it is recommended that Low Vulnerable basements are also not permitted at this site.	Section 9.2
Finished Floor Levels	For the current development site (without mitigation), the Thames Tidal breach modelling Berm22 identifies that under the MLWL 2100 scenario the area at 'Significant Hazard' is at risk of flooding up to 1m. 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. Instead, development could be designed to be floodable with resilient construction.	Section 9.3
Safe Access/Egress	In the event of a Tidal Defence Breach the safest access to the site is provided via Falcon Road to the east of the site. It is necessary to prepare a Flood Warning and Evacuation Plan (FWEP), 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 the Kambala Clubroom, approximately 500m northeast.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_022, 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 2, which is within the London Borough of Wandsworth and drains much of Clapham Junction. The uFMfSW indicates that the site and surrounding area is at high risk of surface water flooding. Previously, there have been three recorded surface water flood incidents, one groundwater and sixteen internal sewer flood events held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 4.0 l/s (1 in 1 year), 15.0 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 potentially unsuitable. 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

SITE 4.1.3 : Land on the corner of Grant Road and Falcon Road, SW11

	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"*.

The proposed development for this site is a mixture of residential and commercial uses. The areas currently developed are at lower flood risk and therefore the More Vulnerable residential development should be located here. The south has slightly greater hazard and therefore should be used for Less Vulnerable town centre uses. Finished floor levels must be raised for all residential properties; alternatively they can be allocated to first floor level and above with Less Vulnerable development on the ground floor. Any development located in the areas of flood hazard should consider flood resistant or resilient measures. 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. SuDS should be incorporated where possible 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 4.1.7 : Winstanley & York Road Estates, SW11

1) PROPOSED DEVELOPMENT

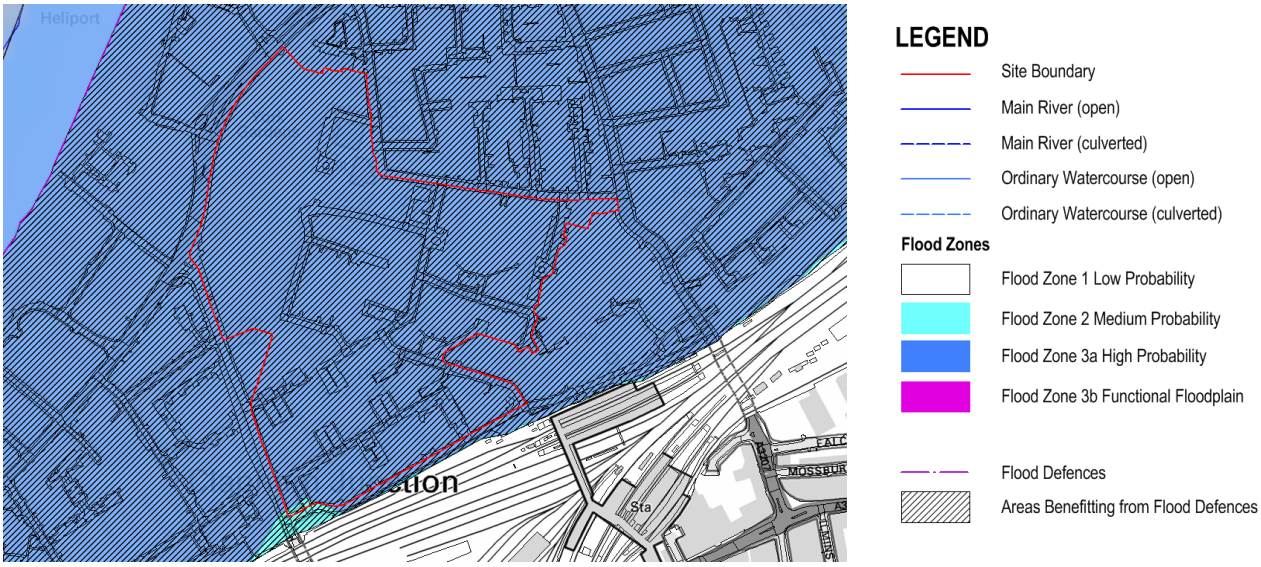
Site ID	4.1.7
Site Address	Winstanley & York Road Estates, SW11
Site Area	Approximately 17 ha
Current Use	Residential and community use.
Allocated Use	Residential and community use, with convenience shopping.
Vulnerability	More vulnerable (residential), Less Vulnerable (commercial)

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located 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	**6**	**0**	**16 Internal**	**0**	**0**

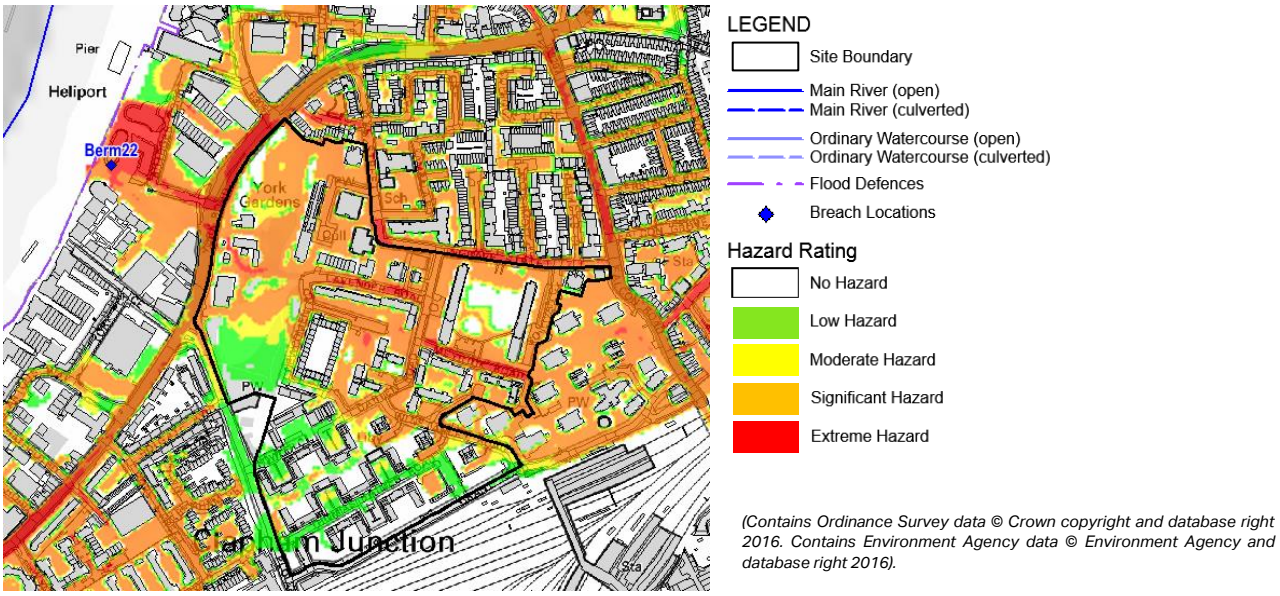
SITE 4.1.7 : Winstanley & York Road Estates, SW11

3) LEVEL 2 ASSESSMENT

The 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 Berm22. The invert level was 4.66 mAOD and the width of the breach is 20m.

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



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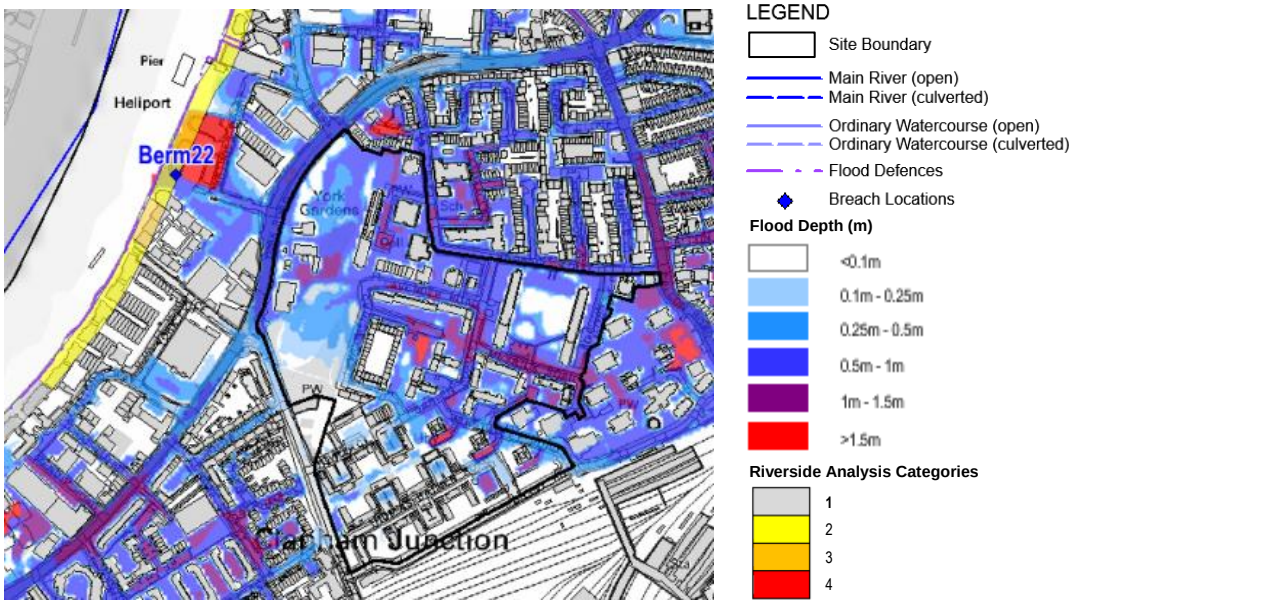
Thames Tidal Breach Modelling: Maximum Flood Depth (MLWL 2100) and Riverside Analysis Categories



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Riverside Analysis

The Riverside Analysis shows that there is 1 breach location 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, which has an Assumed Breach Level of 4.8-5.3 mAOD and Potential Peak Depth of Flow through breach (1 in 1000 year event) 0.5-0m.

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

SITE 4.1.7 : Winstanley & York Road Estates, SW11		
4) RECOMMENDATIONS AND POLICIES		
Development Layout and Sequential Approach	A sequential approach to site layout should be used. The site is entirely within the defended Flood Zone 3a of the River Thames. The Thames Tidal Breach modelling highlights the northern half this site is at "Significant Hazard" surrounding the current development. Towards the southwest of the site there is "Moderate-Low Hazard". There are areas of "No Hazard" in the south; the More Vulnerable residential development should be located here. Where development is required in areas of greater hazard the use should be Less Vulnerable (commercial). 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 basement uses may be allocated anywhere, however, any basement development 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.	Section 9.2
Finished Floor Levels	For the current development site (without mitigation), the Thames Tidal breach modelling Berm22 identifies that under the MLWL 2100 scenario there is an area in the centre at risk of flooding >1.5m, areas in the east at risk of flooding to 1.5m and the majority of the northern half of the site is at risk of flooding up to 1m. The south is at risk of flooding to lower depths of 0-0.5m. 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 (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. Instead, development can be designed to be floodable.	Section 9.3
Safe Access/Egress	In the event of a Tidal Defence Breach the safest access to the site is provided via Plough Road to the east of the site. It is necessary to prepare a Flood Warning and Evacuation Plan (FWEP), 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 the York Gardens Library, located within the site boundary.	Section 9.14
Surface Water Management	**Current risk of flooding** The site is located within Critical Drainage Area (CDA) Group7_022, 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 2, which is within the London Borough of Wandsworth and drains much of Clapham Junction. The uFMfSW indicates that the site and surrounding area is at high risk of surface water flooding. Previously, there have been six recorded surface water flood incidents and sixteen internal sewer flood events held by Wandsworth Council in this location.	
	Indicative existing runoff rate: 70.6 l/s (1 in 1 year), 264.9 l/s (1 in 100 year) **Indicative Greenfield Runoff Rate:** 31.7 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. 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

SITE 4.1.7 : Winstanley & York Road Estates, SW11

	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"*.

The north area of the site is classified as 'Significant Hazard' in the event of a tidal breach in the Thames Tidal Defences at Berm22. The proposed use of this site is a mixture of residential and commercial uses; therefore the More Vulnerable elements of development should be located away from the high risk area in the north and towards the south in the areas where there is no hazard. If development is required in the high risk areas the Less Vulnerable uses should be located on the ground floor. If More Vulnerable development is located in high risk areas then finished floor levels must be raised. Any development located in the areas of flood hazard should consider flood resistant or resilient measures. 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. SuDS should be incorporated where possible to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.