

Level 2 Strategic Flood Risk Assessment

London Borough of Merton

Final Report

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Quality information

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1. Introduction

1.1 Terms of reference

- 1.1.1 AECOM has been commissioned by the London Borough of Wandsworth, on behalf of the London Borough of Wandsworth and the London Borough of Merton to review and update their Level 1 and Level 2 Strategic Flood Risk Assessments (SFRA).

1.2 Project Background

- 1.2.1 The [National Planning Policy Framework](#)¹ (NPPF) and associated [Planning Practice Guidance](#) for Flood Risk and Coastal Change (PPG)² set out the active role Local Planning Authorities (LPAs) should take to ensure that flood risk is understood and managed effectively and sustainably throughout all stages of the planning process. The NPPF outlines that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and LPAs should use the findings to inform strategic land use planning. The overall approach of the NPPF to flood risk is broadly summarised Paragraph 103:

When determining planning applications, LPAs should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific FRA following the Sequential Test, and if required the Exception Test, it can be demonstrated that:

- *within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location, and*
- *development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems.”*

1.3 Level 1 SFRA

- 1.3.1 One combined Level 1 SFRA report has been prepared for the Boroughs. The purpose of the Level 1 SFRA is to collate and analyse the most up to date readily available flood risk information for all sources of flooding and provide an overview of flood risk issues across the study area.
- 1.3.2 The Level 1 SFRA provides guidance on:
- The application of the Sequential Test by each LPA when allocating future development sites to inform their Local Plans, as well as by developers promoting development on windfall sites.
 - Managing and mitigating flood risk, the application of sustainable drainage systems (SuDS), and the preparation of site-specific Flood Risk Assessments (FRAs).
 - Potential flood risk management objectives and policy considerations which may be developed and adopted by the London Boroughs as formal policies within their developing Local Plans.
- 1.3.3 Using the strategic flood risk information presented within the Level 1 SFRA, London Borough of Merton have undertaken the Sequential Test to document the process whereby future development is steered towards areas of lowest flood risk.

1.4 Exception Test

- 1.4.1 Where it is not possible to accommodate potential development sites outside those areas identified to be at risk of flooding, the Exception Test may be required, as set out in Table 1-1. The purpose of the Exception Test is to ensure that where it may be necessary to locate development in areas at risk of flooding, new development is

¹ Department for Communities and Local Government. 2012. *National Planning Policy Framework*. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

² Department for Communities and Local Government. 2014. *Planning Practice Guidance: Flood Risk and Coastal Change*. Available at: <http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/>

only permitted in Flood Zone 2 and Flood Zone 3 where the flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime, considering climate change.

1.4.2 The NPPF states that for the Exception Test to be passed:

- Part 1 - “It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by the SFRA where one has been prepared; and
- Part 2 - A site-specific Flood Risk Assessment must 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.”

1.4.3 Both elements of the test will have to be passed for development to be allocated or permitted.

1.4.4 In order to determine Part 1 of the Exception Test, applicants should assess their scheme against the objectives set out in the LPA’s Sustainability Appraisal³. In order to demonstrate satisfaction of Part 2 of the Exception Test, relevant flood risk management and mitigation measures should be applied and demonstrated within a site-specific flood risk assessment (FRA). Appendix D ‘Managing and Mitigating Flood Risk’ and Appendix E ‘Site Specific Flood Risk Assessments’ within the Level 1 SFRA should be referred to in order to support Part 2 of the Exception Test.

Table 1-1 Flood risk vulnerability and Flood Zone ‘compatibility’ (PPG, 2014)

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	1	✓	✓	✓	✓	✓
	2	✓	✓	Exception Test Required	✓	✓
	3a	Exception Test Required	✓	✗	Exception Test Required	✓
	3b	Exception Test Required	✓	✗	✗	✗

✓ - Development is appropriate ✗ - Development should not be permitted

1.5 Level 2 SFRA

1.5.1 This report comprises the Level 2 SFRA for the London Borough of Merton. The scope of the Level 2 SFRA is to consider the detailed nature of the flood characteristics within a flood zone including, where appropriate and the data is available:

- flood probability;
- flood depth;
- flood velocity;
- rate of onset of flooding; and
- duration of flood.

1.5.2 For the Merton study area, additional information on flood depth and hazard rating associated with the River Wandle and Beverley Brook catchments are available from models provided by the Environment Agency. It is noted that information on the rate of onset of flooding the duration of flooding has not been made available.

1.5.3 The Level 2 SFRA provides a detailed assessment of the following development sites which have been identified by Merton Council as requiring the application of the Exception Test:

- CW1 Baltic Close, Collier’s Wood

³ London Borough of Merton, November 2018, Sustainability Appraisal incorporating Strategic Environmental Assessment (SEA). <https://www.merton.gov.uk/assets/Documents/2018-12%20%20Local%20Plan%20SA%20SEA%20Report.pdf>

- CW2 Brown and Root Phase 2
- CW3 Collier's Wood Community Centre
- CW4 Collier's Wood Station
- CW5 Priory Retail Park, Collier's Wood
- Mo3 Imperial Sports Ground, Morden
- RP2 245-247 Burlington Road
- RP3 Burlington Road Tesco, Raynes Park
- RP4 80-86 Bushey Road
- RP5 AELTC, Grand Drive, Raynes Park
- RP6 Lessa Sports Ground, Raynes Park
- RP8 West Barnes Library
- Wi7 Rufus Business Centre, Wimbledon
- Wi8 South Wimbledon Station
- Wi12 Wimbledon Stadium and Volante Site

1.5.4 Some of the sites within this Level 2 report are located in Flood Zones 2 and in accordance with the NPPF (Table 1-1) the Exception Test is not typically required. However, these sites have been included for assessment to consider whether there is a risk of river flooding in the future as a result of climate change. Where this is shown to be the case, recommendations have been provided to indicate how development may be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, may reduce flood risk overall.

1.6 Site Proformas

1.6.1 A proforma has been prepared for each of the 15 sites identified above to assess the risk of flooding from all sources and provide recommendations for how development could be delivered on the site that would satisfy the requirements of the Exception Test. Table 1-2 provides an overview of the datasets that have been used to populate the proformas. The majority of the datasets used in the Level 2 SFRA are described in full in the Level 1 SFRA⁴.

Table 1-2 Datasets and information used for Level 2 Site Proformas

Proforma Field	Dataset / information used
Site Description	
Site ID	As provided by London Borough of Merton.
Site Address	As provided by London Borough of Merton.
Area (ha)	The area of the site (hectares).
Current use	As provided by London Borough of Merton.
Proposed use	As provided by London Borough of Merton. Where this was not specified, mixed-use including residential has been assumed.
Vulnerability classification	PPG Flood Risk and Coastal Change Table 1.
Flood Zone and Historic Flooding	
Proportion within each Flood Zone and Areas Benefitting from Defences	Flood Map for Planning (Rivers and Sea) Flood Zone 2; Flood Map for Planning (Rivers and Sea) Flood Zone 3; Flood Map for Planning (Rivers and Sea) Areas Benefitting from Defences; Level 1 SFRA Flood Zone 3b Functional Floodplain outline.
Flood Warning Area	Environment Agency Flood Warning Areas.
Emergency Rest Centre	As provided by London Borough of Merton.
Flood Records within 500m of the site	As provided by London Borough of Merton.

⁴ AECOM, May 2020, DRAFT Level 1 Strategic Flood Risk Assessment for London Boroughs of Merton and Wandsworth.

River Flooding

Maximum Flood Depth Map for the River Wandle or Beverley Brook for the 1% AEP event including climate change

River Wandle Climate Change Modelling, August 2017, JBA Consulting on behalf of the Environment Agency. Defended flood event information for the 1% AEP event including 35% increase in flow for climate change.

Beverley Brook Flood Risk Mapping Study, 2008/2009, Royal Haskoning on behalf of the Environment Agency. Defended flood event information for the 1% AEP (plus a 20% increase in flow allowance for climate change) event.

Position Statement July 2020: The Beverley Brook is currently being remodelled on behalf of the Environment Agency. Outputs are not yet available to include in the SFRA. Outputs are expected to include the following events as a minimum: 5%, 1% and 0.1% AEP, as well as the 1% AEP event including 25%, 35% and 70% increases in flow allowances for climate change.

Maximum Flood Hazard Map for the River Wandle or Beverley Brook for the 1% AEP event including climate change

River Wandle Climate Change Modelling, August 2017, JBA Consulting on behalf of the Environment Agency. Defended flood event information for the 1% AEP event including 35% increase in flow for climate change.

Beverley Brook Flood Risk Mapping Study, 2008/2009, Royal Haskoning on behalf of the Environment Agency. Defended flood event information for the 1% AEP (plus a 20% increase in flow allowance for climate change) event.

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Flood hazard mapping categorises the danger to people for different combinations of flood water depth and velocity. The derivation of these categories is based on the methodology set out by Defra in Flood Risks Assessment Guidance for New Development FD2320/TR2⁵ using the following equation:

$$Flood\ Hazard\ Rating = ((v+0.5)*D) + DF$$

Where v = velocity (m/s), D = depth (m), DF = debris factor

Flood Hazard		Description
Low	HR < 0.75	Caution – Flood zone with shallow flowing water or deep standing water
Moderate	0.75 ≥ HR ≤ 1.25	Dangerous for some (i.e. children) – Danger: flood zone with deep or fast flowing water
Significant	1.25 > HR ≤ 2.0	Dangerous for most people – Danger: flood zone with deep fast flowing water
Extreme	HR > 2.0	Dangerous for all – Extreme danger: flood zone with deep fast flowing water

Surface Water Flooding

Risk of Flooding from Surface Water Map

Environment Agency dataset. Obtained January 2020.

Critical Drainage Area

As defined in the Surface Water Management Plan and Level 1 SFRA for London Borough of Merton⁶. Defined as ‘a discrete geographic area (usually within an urban setting) where there may be multiple and interlinked sources of flood risk and where severe weather is known to cause flooding of the area thereby affecting people, property or local infrastructure’. The CDAs for the London Borough of Merton are not restricted to Flood Zone 1.

Drainage Catchment

As defined in the Level 1 SFRA for London Borough of Merton⁴. Drainage catchments outline the area of the land that influences the surface water drainage at a certain point. The scale of a drainage catchment varies depending on the point of interest. The extent of a natural drainage catchment follows peaks in the local topography that surface water will drain from. The DCs are based on the natural catchments and watersheds that cover the borough, which are provided within the Flood Estimation Handbook CD-ROM and have then been amended using local knowledge to account for significant infrastructure within the study area that could impact on drainage such as railway lines.

Groundwater Flooding

Geology

Bedrock and superficial geology underlying the site, based on BGS mapping.

Susceptibility to Groundwater Flooding

The BGS dataset ‘Susceptibility to Groundwater Flooding’ is divided into three classes; (1) High – areas with the potential for groundwater flooding to occur at the surface; (2) Medium – areas which

⁵ Defra and Environment Agency (2005) FD2320/TR2 Flood Risk Assessment Guidance for New Development

⁶ Capita AECOM, 2011, London Borough of Merton Surface Water Management Plan.

may experience groundwater flooding of property situated below the ground surface i.e. basements; (3) Low – areas with limited potential for groundwater flooding to occur. Further information is provided in Section 4.4 of the Level 1 SFRA.

Within an area of increased potential for elevated groundwater	As identified in the SWMP ⁶ .
Within an area of perched groundwater	As identified by LB Merton (Level 1 SFRA ⁴ Section 4.4).
Other sources	
Risk of flooding from reservoirs	As identified on the Environment Agency Long Term Flood Risk Map ⁷ .
Summary	
A written overview of the risk of flooding to the site from all sources based on the information within the proforma.	
Site Specific Recommendations	

Recommendations for how development could be delivered on the site to meet the requirements of part 2 of the Exception Test i.e. that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Recommendations are made in line with the development management measures presented within the Level 1 SFRA⁴ (Appendix D) and typically address the following:

- Applying sequential approach within development site;
- Setting back development from the edge of watercourses;
- Finished floor levels;
- Floodplain compensation storage;
- Access and egress arrangements;
- Flood Warning and Evacuation procedures;
- Surface water management;
- Further investigation of groundwater levels.

1.7 Future Updates to the SFRA

- 1.7.1 SFRA's are intended to be living documents, that are kept up to date as information on flood risk management changes. The Environment Agency [SFRA guidance](#) available online⁸ states that in order to remain up to date, it is necessary to update a SFRA to incorporate any changes to:
- the predicted impacts of climate change on flood risk;
 - detailed flood modelling - such as from the Environment Agency or lead local flood authority;
 - the local plan, spatial development strategy or relevant local development documents;
 - local flood management schemes;
 - flood risk management plans;
 - shoreline management plans;
 - local flood risk management strategies;
 - national planning policy or guidance.
- 1.7.2 At the time of writing, the Environment Agency are updating the hydraulic modelling of the Beverley Brook, to improve the representation of the watercourse. The new modelling will also take account of the latest climate change allowances.
- 1.7.3 London Borough of Merton are also undertaking surface water modelling for West Merton which, once complete, will be used to update the Risk of Flooding from Surface Water mapping.
- 1.7.4 Once these datasets are available it is recommended that they are used to inform the preparation of site specific Flood Risk Assessments for the proposed development on the sites identified within this Level 2 SFRA. The new datasets should also be incorporated into the Level 1 SFRA for London Borough of Merton in due course.

⁷ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

⁸ <https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment>

Appendix A Site Proformas

CW1 Baltic Close, Collier's Wood

CW2 Brown and Root Phase 2

CW3 Collier's Wood Community Centre

CW4 Collier's Wood Station

CW5 Priory Retail Park, Collier's Wood

Mo3 Imperial Sports Ground, Morden

RP2 245-247 Burlington Road

RP3 Burlington Road Tesco, Raynes Park

RP4 80-86 Bushey Road

RP5 AELTC, Grand Drive, Raynes Park

RP6 Lessa Sports Ground, Raynes Park

RP8 West Barnes Library

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