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DRAFT FOR CLIENT COMMENT ONLY

Flood Risk Assessment Rev0

11 Highgate West Hill,
London,
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30 August 2020

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This document has been prepared solely as a Flood Risk Assessment for Constant Structural Design. Base Energy accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

1. Introduction

This Flood Risk Assessment has been prepared in support of the planning application for the proposed basement and rear extension to a residential terrace property - 11 Highgate West Hill - in accordance with the requirements of the National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG).

Development Proposals

A copy of the existing site layout plans is provided in **Appendix A**.

A copy of the proposed site layout plans is provided in **Appendix B**.

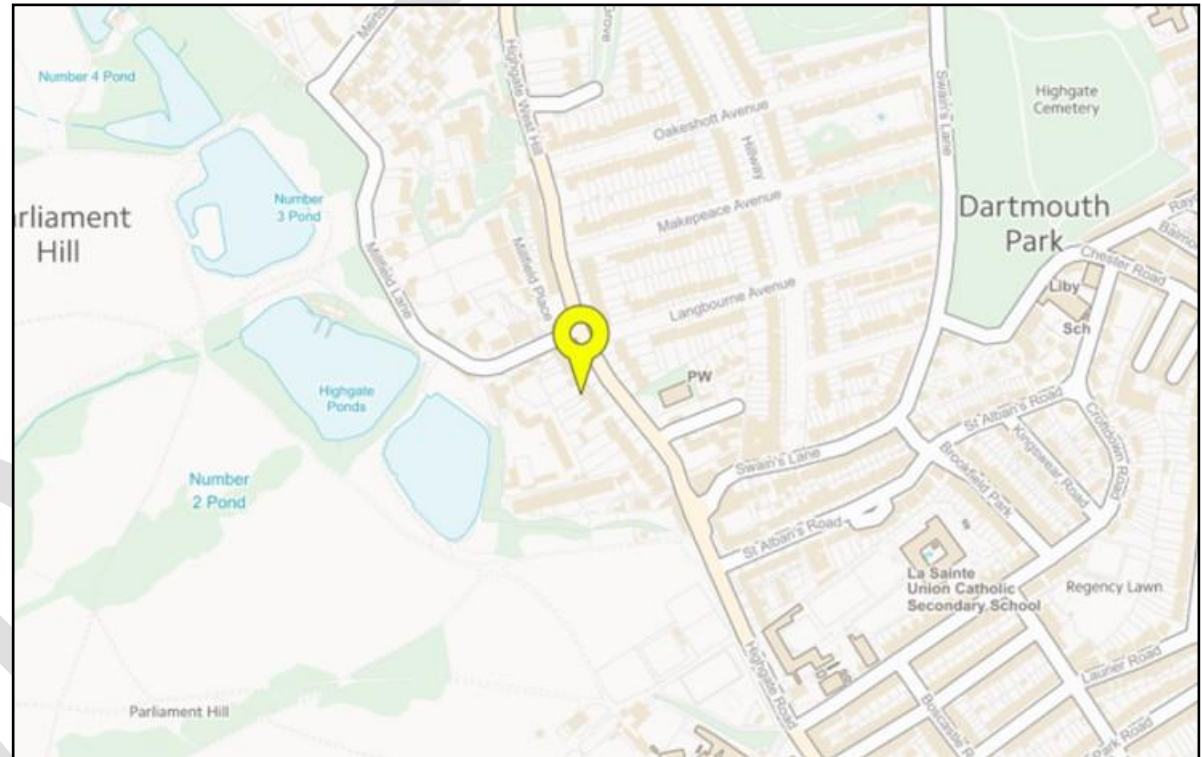


Figure 1 - Site Location and Environment Agency Flood Map

2. Planning Policies

National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG)

The aim of the NPPF (and the accompanying PPG) is to direct development away from areas at highest risk of flooding; where development is necessary, it should be made safe without increasing flood risk elsewhere.

The NPPF states that a Flood Risk Assessment (FRA) is required to support a planning application for developments that are in:

- Flood Zone 2 and/or Flood Zone 3
- Flood Zone 1 and comprise 1ha or above
- Flood Zone 1 and comprises less than 1ha, but is within a designated Critical Drainage Area (CDA), as notified to the Local Planning Authority (LPA) by the Environment Agency (EA)

In order to provide an indication of the flood zone classification of the site, and to ascertain whether an FRA is required, the starting point is the EA flood maps which are available on the EA website.

Environment Agency Flood Map

The EA flood maps show fluvial and tidal flood outlines based on the following:

- Flood Zone 1 - land assessed as having less than 1 in 1000 annual probability of river or sea flooding
- Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding, or between a 1 in 200 and 1 in 1000 annual probability of flooding from the sea
- Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding, or a 1 in 200 or greater annual probability of flooding from the sea

The Environment Agency flood map is provided in **Figure 1** (on the **previous page**) and confirms that the site is located within Flood Zone 1.

Given that the site is less than one hectare and is located in Flood Zone 1, under the NPPF a full FRA would not be required, unless the site is shown to be located within a CDA.

Critical Drainage Area

Reference has been made to the Camden Strategic Flood Risk Assessment (SFRA) which provides maps illustrating CDAs across the borough. As shown in **Appendix C** the site is located within a CDA (Group3_001) and also is located within the York Rise Local Flood Risk Zone.

As such, under the NPPF an FRA is required to support the planning application.

The following section of this FRA (Section 3) provides more details on the sources of flood risk to the site, and Section 4 provides an overview of the proposed flood mitigation measures.

3. Flood Risk

Fluvial Flood Risk

The site is shown to be located within Flood Zone 1 and is therefore considered to be at low risk of fluvial / tidal flooding.

Critical Drainage Area

As previously detailed, the site is within CDA (Group3_001). The Camden SFRA defines a CDA as:

“A discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during severe weather thereby affecting people, property or local infrastructure.”

The SFRA also states:

Therefore a specific area within a CDA is not necessarily at higher risk from surface water than an area outside of a CDA. However the location of an area within a CDA indicates that it is within a catchment area which contributes to a flooding hotspot. Within CDAs, surface water management should be a particular focus of new developments

Local Flood Risk Zones (LFRZ)

The site is also shown to be within the York Rise Local Flood Risk Zone.

The Camden SFRA states ‘Local Flood Risk Zones are defined as discrete areas of flooding that do not exceed the national criteria for a ‘Flood Risk Area’ but still affect houses, businesses or infrastructure. A LFRZ is defined as the actual spatial extent of predicted flooding in a single location’.

Reservoir Flooding

The EA provide maps on their website which illustrates the extent of flooding in the unlikely event of reservoir failure.

The SFRA states that:

The mapping shows that in the unlikely event of Hampstead Pond No. 1 failing, water would initially flow southwards towards Hampstead Heath Rail and Overground Station and then eastwards as far as Gospel Oak Rail and Overground Station. Flood depths could potentially reach between 0.3m and 2m, with isolated areas where depths could potentially reach over 2m, with flood velocities exceeding 2m/s.

In the event that Highgate Ponds No. 2 or 3 failed, flood waters would flow south-east from Hampstead Heath and reach as far east as York Rise in Dartmouth Park. Flood water would also flow southwards towards the rail line west of Kentish Town and then along the rail line as far as just north of St Pancras rail station. Flood depths would be predominantly between 0.3m and 2m and flood velocities between 0.5m/s and 2m/s, with isolated areas of velocities above 2m/s.

In the event that Highgate Pond No. 3 failed, flood waters would flow further south nearly as far south as Pentonville Road.

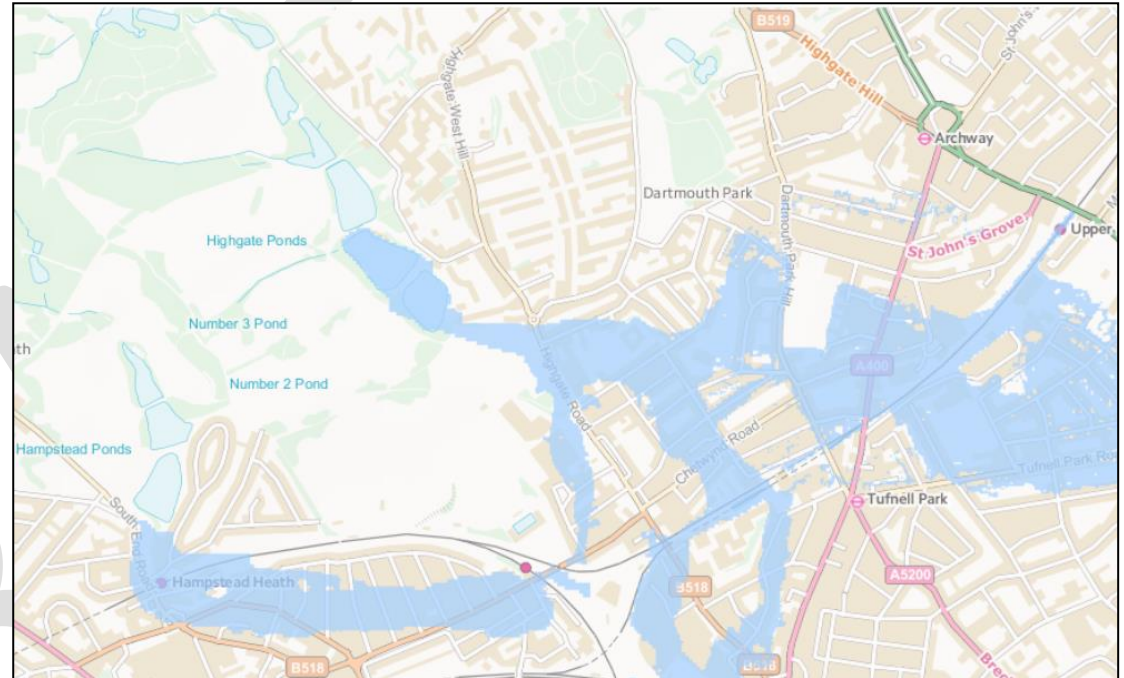


Figure 2 - Environment Agency Reservoir Flooding Map

Groundwater Flooding

Groundwater flooding generally occurs during intense, long-duration rainfall events, when infiltration of rainwater into the ground raises the level of the water table until it exceeds ground levels. It is most common in low-lying areas overlain by permeable soils and permeable geology, or in areas with a naturally high water table.

Reference has been made to the British Geological Survey geology maps; these indicate that the site is underlain by London Clay Formation.

The SFRA provides records of groundwater flooding across the borough; the site is not shown to be in an area where there are records of groundwater flooding.

Irrespective, given that basement development is being proposed, more detailed consideration should be given to site specific groundwater levels and any potential impact on the structure of the basement.

Surface Water Flooding

Surface water flooding results from rainfall generated overland flows, before the runoff reaches a watercourse/ drainage system, or where the watercourse/ drainage system is overwhelmed and unable to accept further runoff. Surface water runoff is usually associated with high intensity rainfall events but may also occur with lower intensity rainfall where the ground is saturated, developed or otherwise has low permeability resulting in overland flows and ponding within depressions in the topography.

The SFRA includes maps which illustrate the potential risk of surface water flooding. A copy of the map is provided overleaf.

As shown in **Figure 3**, the maps confirm that Highgate West Hill is at high risk of surface water flooding.

Following redevelopment of the site, the surface water drainage arrangements will ensure that there will be no increase in rates and volumes of surface water runoff (when compared with the existing situation); therefore, surface water flood risk will not be exacerbated at the site and surrounding areas.

Sewer Flooding

The SFRA make references to incidents of sewer flooding across the borough. The site is not shown to have been subject to sewer flooding.

Following redevelopment of the site, the surface water drainage strategy will ensure that there will be no increase in the peak rates and volumes of surface water runoff entering the public sewer network. On this basis, the development will not exacerbate the risk of sewer flooding.

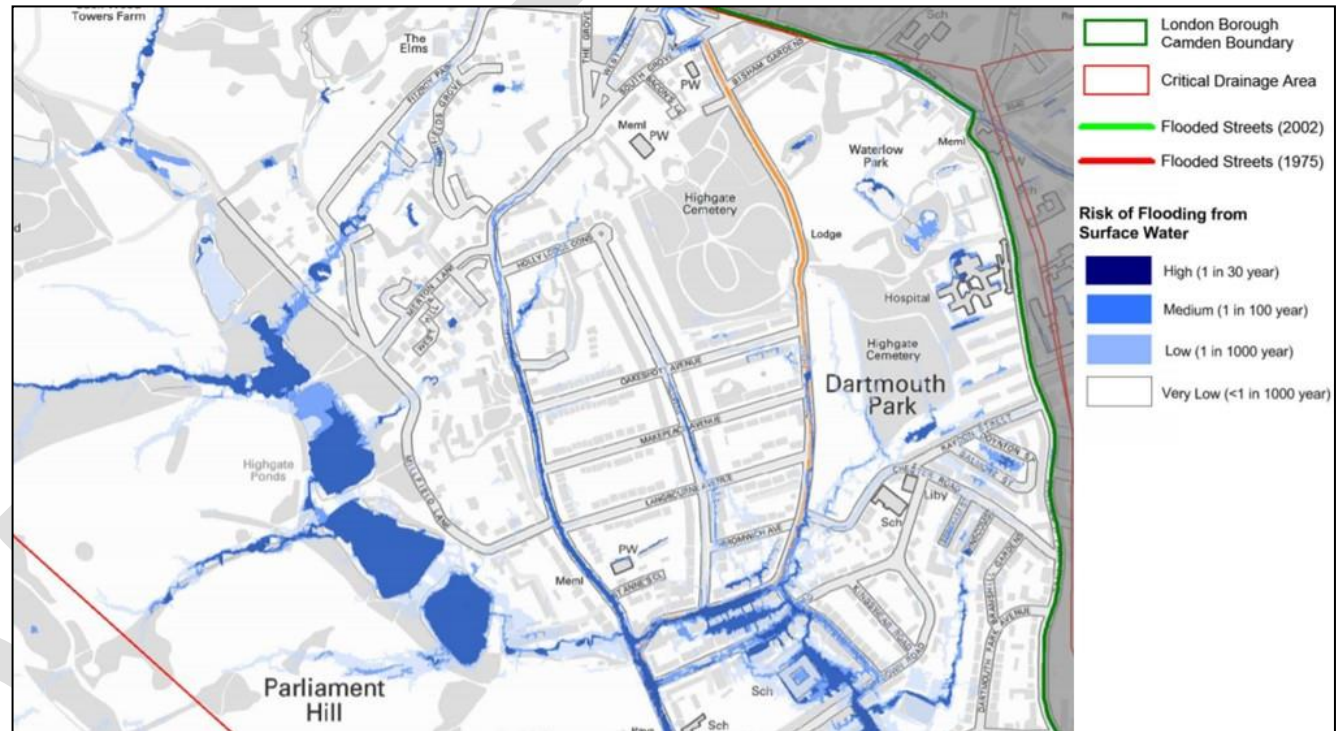


Figure 3 - SFRA Surface Water Flooding Map

4. Flood Mitigation

Given that the site is within a designated CDA and LFRZ the following should be considered in order to mitigate any residual risk of flooding at the site, and to ensure that the proposals do not exacerbate flood risk in the surrounding area.

Basement

The basement will form part of the existing dwelling house; there will be internal access from the basement to the ground floor (see **Appendix B**).

The desktop study of underlying ground conditions indicates that the risk of groundwater flooding at the site is low.

However, a Basement Impact Assessment may be required by Camden Council. The assessment should consider how the basements will affect groundwater flow in the local area. Factors which will influence this are the geological setting, thickness of the strata, the depths to the water table and permeability/confining nature of the layers.

The advice of a Structural Engineer or Specialist should always be followed.

Flood Resilient Construction

Flood resilient construction techniques will be incorporated into the extension and basement, in line with guidance provided in the Communities and Local Government Document, *Improving the Flood Performance of New Buildings: Flood Resilient Construction*¹. These include:

- Flood resilient building materials and fittings
- Non-return valves

The Design Team will ensure that the most appropriate measures are incorporated into the proposals.

¹ Improving the Flood Performance of New Buildings: Flood Resilient Construction. Department for Communities and Local Government. May 2007.

Surface Water and SuDS

In order to ensure that the proposals do not exacerbate the risk of surface water flooding, the surface water drainage arrangements for the redeveloped site will ensure that there is no increase in flows of surface water runoff when compared with the existing site.

In line with the London Plan and local planning policy, the redevelopment will utilise Sustainable Drainage Systems (SuDS). Rate of runoff will be no greater than the existing greenfield rate of runoff.

This should be addressed in a surface water and SuDS assessment.

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5. Conclusions

This Flood Risk Assessment has been prepared in support of the planning application for the proposed basement and rear extension to a residential terrace property - 11 Highgate West Hill - in accordance with the requirements of the National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG).

Flood Risk

- The site is shown to be located within Flood Zone 1 and is therefore considered to be at low risk of fluvial / tidal flooding.
- The site is within CDA (Group3_001).
- The site is also shown to be within the York Rise Local Flood Risk Zone.
- In the unlikely event of reservoir failure, floodwaters may flow through the site.
- Based on the desktop study of underlying ground conditions, the site is considered to be at low risk of groundwater flooding.
- The SFRA maps confirm that Highgate West Hill is at high risk of surface water flooding.

Flood Mitigation

- The basement will form part of the existing dwelling house; there will be internal access from the basement to the ground floor.
- A Basement Impact Assessment may be required by Camden Council. The assessment should consider how the basements will affect groundwater flow in the local area. Factors which will influence this are the geological setting, thickness of the strata, the depths to the water table and permeability/confining nature of the layers.
- The advice of a Structural Engineer or Specialist should always be followed.

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- Flood resilient construction techniques will be incorporated into the extension and basement, in line with best practice guidance. The Design Team will ensure that the most appropriate measures are incorporated into the proposals.
 - In line with the London Plan and local planning policy, the redevelopment will utilise Sustainable Drainage Systems (SuDS). Rate of runoff will be no greater than the existing greenfield rate of runoff. This should be addressed in a surface water and SuDS assessment.

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Appendices

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Appendix A - Proposed Site Layout Plans

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Appendix B - London Borough of Sutton Critical Drainage Area Map

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