

WE LISTEN, WE PLAN, WE DELIVER

Geotechnical Engineering and Environmental Services across the UK.

## FLOOD RISK ASSESSMENT

138-140 Highgate Road, London, NW5 1PB

**JOMAS ASSOCIATES LTD**

6-9 The Square, Stockley Park, Uxbridge, UB11 1FW

[www.jomasassociates.com](http://www.jomasassociates.com) 0843-289-2187 [info@jomasassociates.com](mailto:info@jomasassociates.com)

**Report Title:** FLOOD RISK ASSESSMENT

**Report Status:** Final v1.0

**Job No:** P1323J1303

**Date:** 3 July 2020

**Control: Previous Release**

Version	Date	Issued By
V1.0	03/07/20	A Wallace

Prepared by: **JOMAS ASSOCIATES LTD** For **Design Ventures Highgate**

Should you have any queries relating to this report, please contact

**JOMAS ASSOCIATES LTD**

[www.jomasassociates.com](http://www.jomasassociates.com)

0843 289 2187

[info@jomasassociates.com](mailto:info@jomasassociates.com)

**TABLE OF CONTENTS**

**1 EXECUTIVE SUMMARY ..... 5**

**2 INTRODUCTION ..... 6**

**3 SITE DESCRIPTION..... 7**

3.1 Topography .....7

**4 DESIGN PRINCIPLES AND POLICY REQUIREMENTS ..... 8**

4.2 General Principles for Flooding.....8

**5 FLOODING INFORMATION ..... 9**

5.1 Flood Risk from Rivers (Fluvial) .....9

5.2 Coastal and Tidal Flood Risk .....9

5.3 Geology and Hydrogeology (Groundwater) .....9

5.4 Surface Water Flood Risk (Overland Flows) .....9

5.5 Sewer/Drainage Flood Risk ..... 10

5.6 Reservoir Flood Risk ..... 11

5.7 Local Flooding ..... 11

5.8 DEFRA flood risk ..... 12

5.9 Summary of risk levels ..... 12

**6 SITE FLOOD RISK REDUCTION..... 13**

6.1 Site Drainage ..... 13

6.2 Flood Risk Reduction ..... 13

6.3 CPG3 - Flooding ..... 13

**List of Figures**

Figure 1: EA Flood Risk from Surface Water Map ..... 10

Figure 2: Camden Council Flood Risk Zones..... 11

**List of Tables**

Table 1: EA Surface Water Flood Risk Categories ..... 9

Table 2: Flood Risk Categories ..... 12

**List of Appendices**

**APPENDIX A: PROPOSED DEVELOPMENT DETAILS ..... 14**

**Quality Standards Control**

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

This document must only be treated as a draft unless it has been signed by the originators and approved by a director.

<i>Revision</i>	<i>V01</i>
Date	03/07/2020
Prepared by	A Wallace
Checked by	A Alsop
Authorised by	A Wallace

## Limitations

JOMAS ASSOCIATES Ltd (“JA”) has prepared this report for the sole use of the client in accordance with the agreement under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by JA.

The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by SC has not been independently verified by JA, unless otherwise stated in the report.

The methodology adopted and the sources of information used by JA in providing its services are outlined in this report. The work described in this report was undertaken in **July 2020** and is based on the conditions encountered and the information available during the said period of time. The scope of this report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

JA disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to JA’s attention after the date of the report.

Certain statements made in the report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JA specifically does not guarantee or warrant any estimate or projections contained in this report.

Costs may vary outside the ranges quoted. Whilst cost estimates are provided for individual issues in this report these are based upon information at the time which can be incomplete. Cost estimates for such issues may therefore vary from those provided. Where costs are supplied, these estimates should be considered in aggregate only. No reliance should be made in relation to any division of aggregate costs, including in relation to any issue, site or other subdivision.

No allowance has been made for changes in prices or exchange rates or changes in any other conditions which may result in price fluctuations in the future. Where assessments of works or costs necessary to achieve compliance have been made, these are based upon measures which, in JA’s experience, could normally be negotiated with the relevant authorities under present legislation and enforcement practice, assuming a proactive and reasonable approach by site management.

Forecast cost estimates do not include such costs associated with any negotiations, appeals or other non-technical actions associated with the agreement on measures to meet the requirements of the authorities, nor are potential business loss and interruption costs considered that may be incurred as part of any technical measures.

## Copyright

© This report is the copyright of JA. Any unauthorised reproduction or usage by any person other than the addressee is strictly prohibited.

**1 EXECUTIVE SUMMARY**

This Flood Risk Assessment reviews the existing and proposed drainage arrangement at the application site and proposes a Flood Risk Assessment based upon the requirements of the Lead Local Flood Authority (LLFA) guidance.

The site is currently occupied by a single property and located at 138-140 Highgate Road, London NW5 1PB.

The proposed development comprises the construction of a new block of terraced houses with associated external works.

Flooding

The site is less than 1 hectare in size and within flood zone 1. The sources of flooding assessed and proposed mitigation measures are listed in the table below.

Source	Risk Category (after mitigation)	Comments
Fluvial (Rivers and Sea)	Very Low	Site within flood zone 1
Coastal and tidal	Negligible	Not near coast or tidal waterbody
Groundwater	Very Low	Proposed finished floor levels are 150mm above external ground levels and natural topography and drainage design reduces risk.
Surface water	Very Low	Site is within an area at low risk of surface water flooding and design further reduces this risk
Sewers	Very Low	Low due to natural topography and sewer location
Reservoirs	Negligible	Reservoirs at minimal risk of failure
SFRA	Very Low	Natural topography minimises risk
DEFRA	Very Low	Site not at long term risk

Basement Flooding

The basement drainage has been designed to cater for the 100 year +40% climate change storm event through the provision of a dewatering and pump system.

In the event of pump failure, a warning light and siren should be provided as part of the pump system to alert inhabitants to the risk of flooding.

In the event of flooding, access is available to the upper levels of the site and all building inhabitants should be informed of the escape route to the upper levels.

Overall, the proposed development has an acceptable flood risk within the terms and requirements of the LLFA.

## 2 INTRODUCTION

- 2.1.1 Jomas was commissioned to undertake a Flood Assessment for the proposed development of land located at 138-140 Highgate Road, London NW5 1PB.
- 2.1.2 The proposed development comprises the construction of a new row of terraced houses with associated external works.
- 2.1.3 This Flooding Assessment has been produced in support of a planning application and should be read in conjunction with the other planning documents including the existing drainage strategy prepared by AMA ref. 18035.

### 3 SITE DESCRIPTION

#### 3.1 Topography

##### *Site Topography*

- 3.1.1 The site falls from northeast to southwest and into Highgate Ave with a level difference of approximately 4.5m. A topographic survey and proposed development plans are provided in Appendix A.



## 4 DESIGN PRINCIPLES AND POLICY REQUIREMENTS

- 4.1.1 Since April 2015, Lead Local Flood Authorities (LLFA's) have become a statutory consultee on surface water drainage for many planning applications. For this site, the following is considered to be the required level of detail required for planning approval:
- 4.1.2 A flooding report to be prepared in accordance with the Camden Councils Strategic Flood Risk Assessment (SFRA) and SUDS policies as the Lead Local Flood Authority (LLFA).
- 4.1.3 Camden Council have specifically requested the following items are also considered:
- CPG Water and Flooding (and CC3 in the LP), regarding the Local Authority expectations;
  - the Strategic Flood Risk Assessment, for further information about the area and locality;
  - the Defra long-term maps for the location, to view flood extent, hazard and velocity

### 4.2 General Principles for Flooding

- 4.2.1 The National Planning Policy Framework (NPPF) states that when determining planning applications, local planning authorities 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. This assessment is required for:

*“Proposals of 1 hectare (ha) or greater in Flood Zone 1, all new development (including minor development and change of use) in Flood Zones 2 and 3 and an area within Flood Zone 1, which has critical drainage problems as notified to the local planning authority by the Environment Agency (EA).”*

- 4.2.2 In accordance with the March 2014 Planning Practice Guidance (PPG), which supports the NPPF, the objectives of this FRA are to establish:
- *Whether a proposed development is likely to be affected by current or future flooding from any source;*
  - *Whether it will increase flood risk elsewhere;*
  - *Whether the measures proposed to deal with these effects and risks are appropriate.*

**5 FLOODING INFORMATION**

**5.1 Flood Risk from Rivers (Fluvial)**

- 5.1.1 As the site is within Flood Zone 1, there is a low risk of fluvial flooding to the site.
- 5.1.2 Based on the above, the risk of flooding from rivers is considered very low.

**5.2 Coastal and Tidal Flood Risk**

- 5.2.1 The site is located inland and is not near any tidally influenced watercourses; therefore, there is negligible risk of flooding from this source.

**5.3 Geology and Hydrogeology (Groundwater)**

- 5.3.1 The British Geological Survey (BGS) mapping available on line suggests that the area is underlain by London Clay Formation - Clay and Silt. Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.
- 5.3.2 The MAGIC Map indicates the area is not of any note regarding ground conditions.
- 5.3.3 No onsite ground water testing is available for the site at the time of producing this report.
- 5.3.4 Due to the presence of the impermeable clay, groundwater is unlikely to raise above ground level, hence the risk of flooding from ground water is considered very low.

**5.4 Surface Water Flood Risk (Overland Flows)**

- 5.4.1 Surface water flooding occurs when the rainwater does not drain away through the normal drainage system or infiltrate the ground, but instead lies on or flows over the ground.
- 5.4.2 The EA produced a Risk of Flooding from Surface Water Map in December 2013. The maps were produced using ‘direct rainfall’ modelling. Although they consider local drainage capacity, non-surface water influences such as rivers, seas or groundwater are not considered. The map is based on LIDAR topographic data which is not suitable for site specific assessment and therefore, where available, topographic survey data should be used to provide a more accurate understanding of potential flow paths.
- 5.4.3 The map shows the entire country within four different risk categories, defined below in Table 1.

*Table 1: EA Surface Water Flood Risk Categories*

Risk Category	Definition
High	Each year, there is a chance of flooding of greater than 1 in 30 (3.3%)

Medium	Each year, there is a chance of flooding of between 1 in 30 (3.3%) and 1 in 100 (1%)
Low	Each year, there is a chance of flooding of between 1 in 100 (1%) and 1 in 1000 (0.1%)
Very Low	Each year, there is a chance of flooding of less than 1 in 1000 (0.1%)

5.4.4 An extract of the map, provided below, shows that the area is generally not susceptible to surface water flooding.

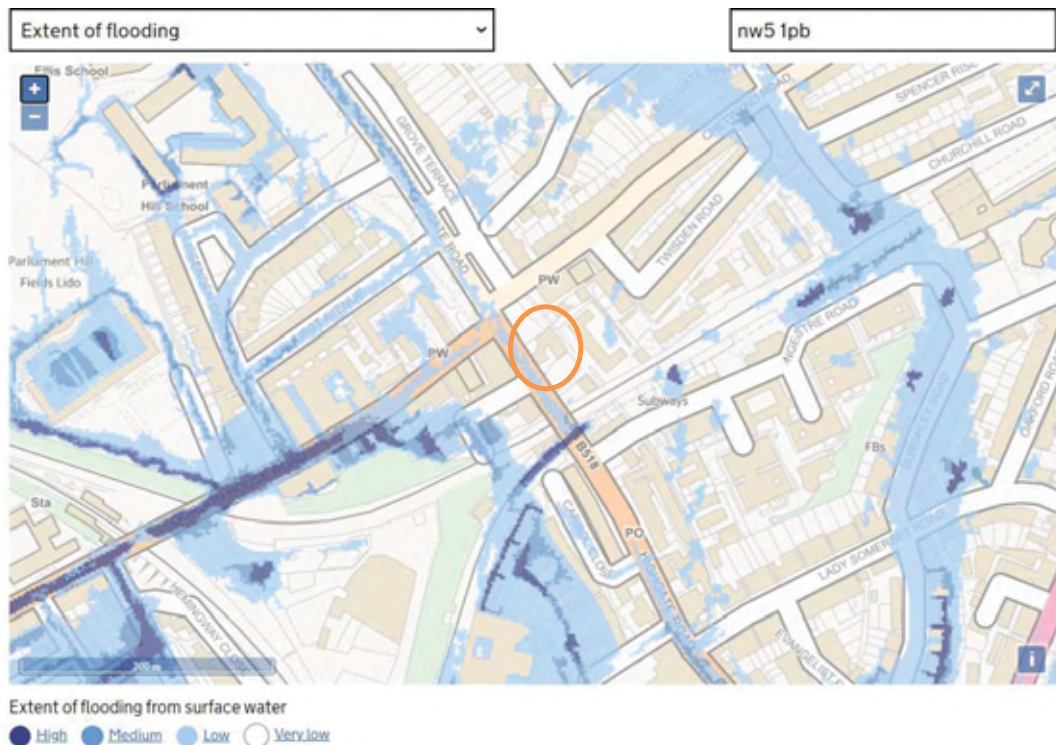


Figure 1: EA Flood Risk from Surface Water Map

5.4.5 Based on the EA’s mapping, historical data and local topography, risk of surface water flooding to the site is considered to be very low.

**5.5 Sewer/Drainage Flood Risk**

5.5.1 Sewer flooding is often caused by excess surface water entering the drainage system when there is insufficient sewer capacity to cope with this excess water, but also due to ‘one off’ events such as blockages.

5.5.2 Thames Water is the statutory undertaker for the local public sewer network. The nearest Thames Water sewers to the site are located within the street at the site frontage.

5.5.3 As the site falls towards the street and the existing sewers, the risk of sewer flooding is considered to be very low.

**5.6 Reservoir Flood Risk**

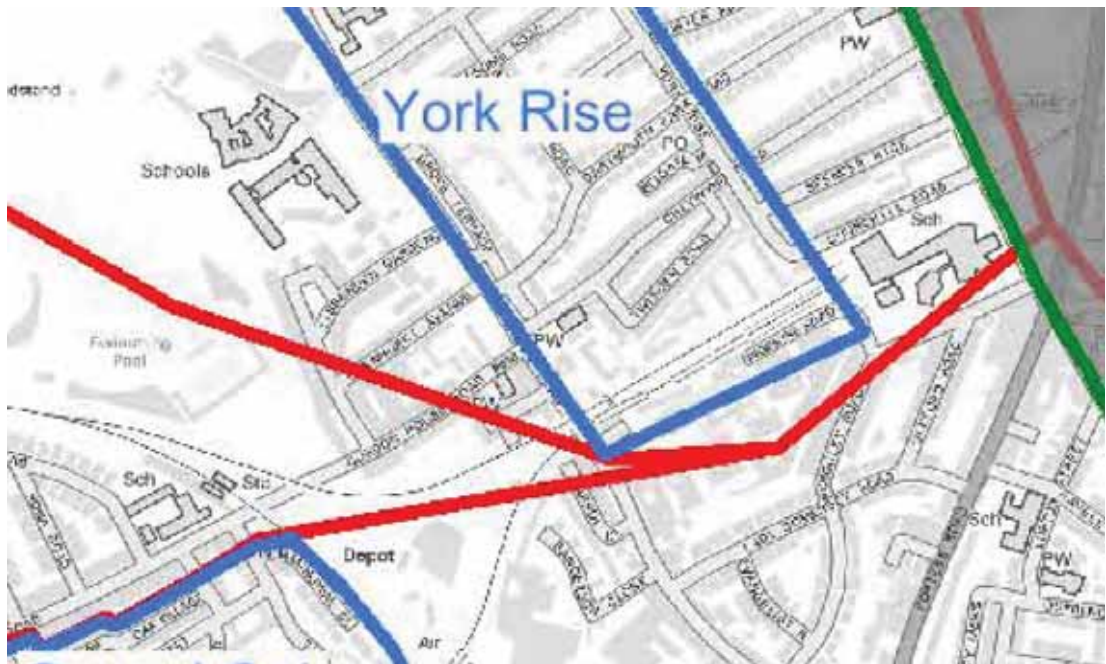
5.6.1 The EA has produced a Reservoir Flood Map that shows that the site is at risk from reservoir flooding. This map indicates very low risk of reservoir flooding at this site.

5.6.2 It should be emphasised that the risk of flooding from reservoir breach is very small since the EA is the enforcement authority for the Reservoirs Act (1975) and all large raised reservoirs are inspected and supervised by reservoir panel engineers.

5.6.3 On the basis there is considered to be a negligible risk of reservoir flooding to the site.

**5.7 Local Flooding**

5.7.1 The site is located within the York Rise flood risk zone as defined by the Camden Council SFRA. See below extract from the map.



**Figure 2: Camden Council Flood Risk Zones**

5.7.2 According to the SFRA “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.”*

5.7.3 While the area is prone to flooding if the Highgate Ponds failed, the site is raised significantly above Highgate Road and falls steeply from the rear of the site to the road (level difference of approx. 4.5m), hence in any flood event, water would run down Highgate Road and not through the site.

**5.8 DEFRA flood risk**

5.8.1 The DEFRA flood risk assessment for this location indicates the site is at very low risk of flooding from all sources.

**5.9 Summary of risk levels**

5.9.1 Pre-development, the risk of flooding is summarised below.

*Table 2: Flood Risk Categories*

Source	Risk Category
Fluvial (Rivers and Sea)	Very low
Coastal and tidal	Negligible
Groundwater	Very low
Surface water	Very low
Sewers	Very low
Reservoirs	Negligible
SFRA	Very low
DEFRA	Very low

## **6 SITE FLOOD RISK REDUCTION**

### **6.1 Site Drainage**

6.1.1 The site drainage has been designed to ensure there is no increased risk of flooding downstream of the site. See the drainage strategy report by AMA consulting (ref. 18035) for further information.

### **6.2 Flood Risk Reduction**

6.2.1 As stated in section 5 above, the risk of flooding from all sources at this site is very low. However, as the development proposes a number of basement levels, basement flooding must be considered.

6.2.2 As stated in the AMA drainage strategy report, the basement drainage has been designed to cater for the 100 year +40% climate change storm event through the provision of a dewatering and pump system.

6.2.3 In the event of pump failure, a warning light and siren should be provided as part of the pump system to alert inhabitants to the risk of flooding.

6.2.4 In the event of flooding, access is available to the upper levels of the site and all building inhabitants should be informed of the escape route to the upper levels.

### **6.3 CPG3 - Flooding**

6.3.1 Camden planning document CPG3 requires:

- All Developments must not increase risk of flooding
- Developments are required to utilise SUDS

6.3.2 The AMA drainage strategy proposes extensive use of SUDS and reduces the surface water discharge from the site to ensure no increased risk of flooding, hence both parts of the requirements of CPG3 are fulfilled.