FLOOD RISK ASSESSMENT

19 HOLMDALE ROAD
CAMDEN

LBHGEO

LBH4620fra

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FOREWORD-GUIDANCE NOTES

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THIRD PARTY INFORMATION

The report may present an opinion based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

1. INTRODUCTION

1.1 BACKGROUND

It is proposed to construct a new basement beneath the existing property at No. 19 Holmdale Road.

The basement is proposed beneath the full footprint of the property, extending to both the front and rear to provide lightwell/sunken patio areas.

1.2 BRIEF

The Basement Impact Assessment prepared by LBHGEO has identified that the site to be within an area at a high risk of surface water flooding.

LBHGEO have therefore been appointed to prepare a Flood Risk Assessment (FRA) in support of a forthcoming planning application to be submitted to the London Borough of Camden.

1.3 GUIDANCE FOR FLOOD RISK ASSESSMENT

The Ministry of Housing, Communities and Local Government have published their online guidance for Flood Risk and coastal change that supersedes the National Planning Policy Framework Technical Guidance of March 2012.

A Flood Risk Assessment is required to assess the potential for the development to increase flood risk elsewhere, in addition to assessing the site vulnerability to flooding from other sources including groundwater and overland runoff, rivers and the sea.

This report identifies the sources of flooding which may affect the site, and includes the following:-

- An appraisal of the availability and adequacy of existing information
- A qualitative appraisal of the flood risk posed to the site, and potential impact of the development on flood risk elsewhere
- An appraisal of the scope of possible measures to reduce the flood risk to acceptable levels

The assessment has been based on existing reports and archive information together with information from historical maps and photographs.

1.4 REPORT STRUCTURE

The report initially describes the site characteristics including the topographical, geological and hydrological setting of the site, following which consideration is given to flood risk.

2. THE SITE

2.1 SITE LOCATION

The site is located on the eastern side of Holmdale Road in West Hampstead and may be approximately located by the postcode NW6 1BJ or by National Grid Reference 525280, 185165.

2.2 TOPOGRAPHICAL SETTING

The site lies on the lower southwestern slopes of Hampstead Hill on land that falls gently to the southwest.

The course of a tributary of the “lost” River Westbourne runs a short distance to the southeast of the site.

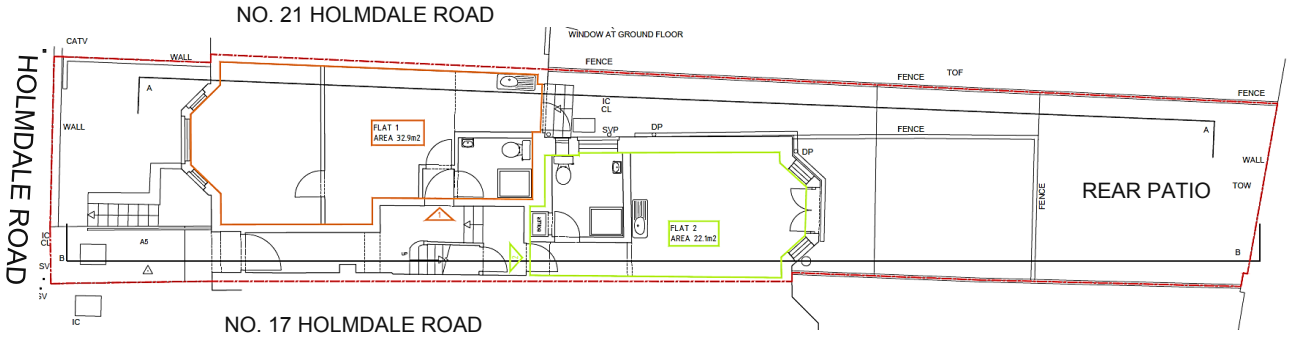
2.3 SITE DESCRIPTION

The site is occupied by a three storey Victorian terraced building, with patios to the front and rear. The patios are entirely hard surfaced, with no soft landscaped areas present on site.

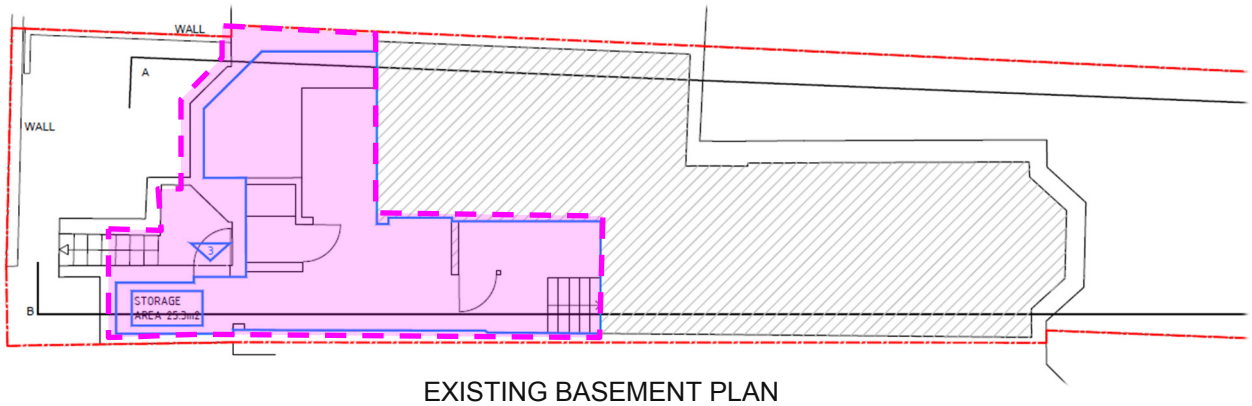
The existing ground floor is situated some 200mm above the street level (at approx. +50.2m OD), which steps down towards the rear of the building to a level of approx. +49.7m OD.

There is a limited basement cellar beneath the front section of this property, accessible by a staircase adjacent to the front entrance. The existing basement floor is situated at approx. +48m OD (approx. 2m below the ground floor level).

EXISTING FRONT ELEVATION



EXISTING SITE PLAN – GROUND FLOOR



EXISTING BASEMENT PLAN

The rear garden boundary is marked by an approximately 4m high brick wall, partially acting as a retaining wall, against the play area of the recently constructed Emmanuel Church of England Primary School, situated approx. 2m higher than the site.

Timber fencing separates the site from the rear gardens of the neighbouring terraced properties, which are situated at approximately similar levels, sloping slightly southwards.

VIEW TOWARDS THE REAR OF THE SITE, SHOWING THE PARTIAL RETAINING WALL TO THE PLAYING FIELDS

REAR ELEVATION AND PATIO AREA, SHOWING THE INTERNAL DIVISON OF THE AREA

2.4 GEOLOGICAL INFORMATION

The site is directly underlain by the London Clay Formation.

A recent site investigation suggests that approximately up to a metre of made ground is present above the clay.

2.5 HYDROGEOLOGICAL / HYDROLOGICAL INFORMATION

The London Clay Formation is virtually impermeable; hence no significant groundwater flow is expected to occur beneath the site.

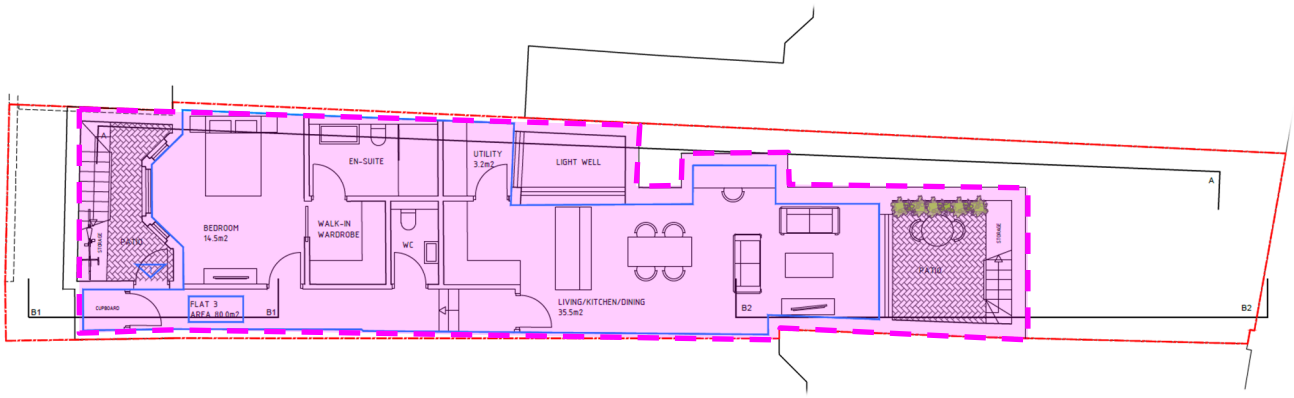
The closest surface water feature to the site is the culverted River Westbourne running southwards at a short distance to the southeast of the site.

2.6 PROPOSED DEVELOPMENT

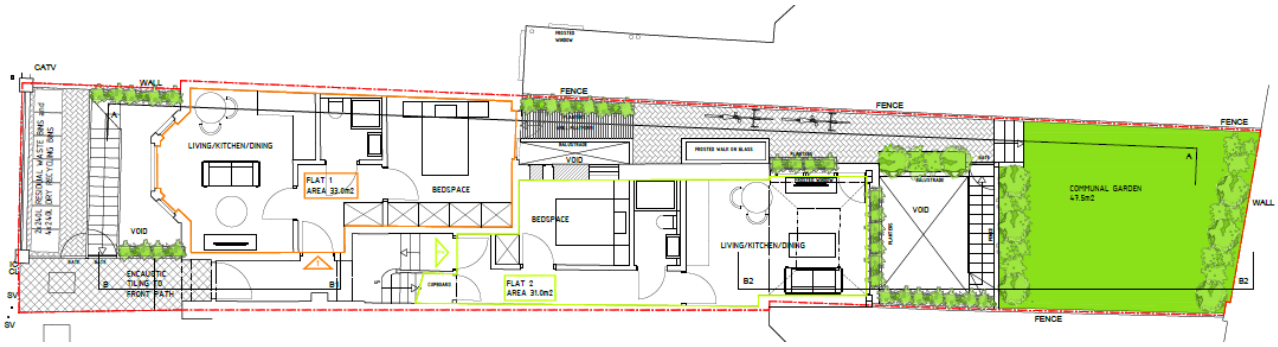
A new basement is to be constructed beneath the entire footprint of the existing property, including deepening of the existing basement area to the front, together with excavations to the front and rear to provide lightwells and sunken patio areas.

The excavations are therefore expected to extend to approx. +47m OD (approx. 3m below the existing ground floor level).

A soft garden area is to be introduced at ground floor level, to the far rear of the site, replacing the currently hard surfaced patio area.



BASEMENT (proposed)



GROUND FLOOR (proposed)

3. FLOODING BACKGROUND

3.1 EXISTING FLOOD ALLEVIATION MEASURES

No evidence of any existing alleviation measures in the vicinity of the site has been identified.

3.2 FLOOD RISK VULNERABILITY CLASSIFICATION

Table 2 of the online guidance indicates that the proposed development falls into the 'highly vulnerable' flood risk classification.

3.3 THE SEQUENTIAL TEST

The guidance requires that the risk based sequential test should be applied at all stages of planning, which aims to steer new development to areas at the lowest probability of flooding (Flood Zone 1).

The site and surrounding area are located entirely within Flood Zone 1.

As a result, it is considered that the Sequential Test is satisfied.

3.4 THE EXCEPTION TEST

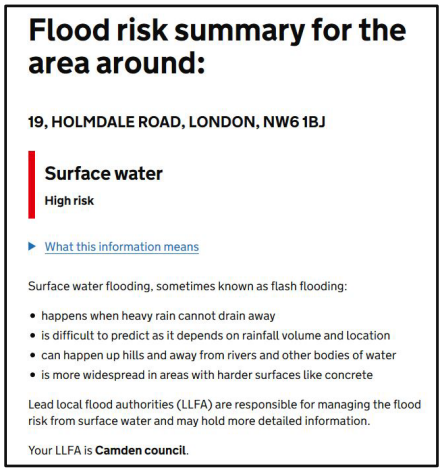
Table 3 of the guidance does not require the Exception Test to be applied given that in Flood Zone 1 Highly Vulnerable Development is considered appropriate.

4. HAZARD IDENTIFICATION

4.1 FLOODING FROM RIVERS AND THE SEA

All main rivers located within the London Borough of Camden are culverted and are incorporated into the Thames Water sewer network. As a result, the London Borough of Camden is located entirely within Flood Zone 1. This indicates that the assessed annual probability of flooding at the site is less than 1 in 1000 (<0.1%).

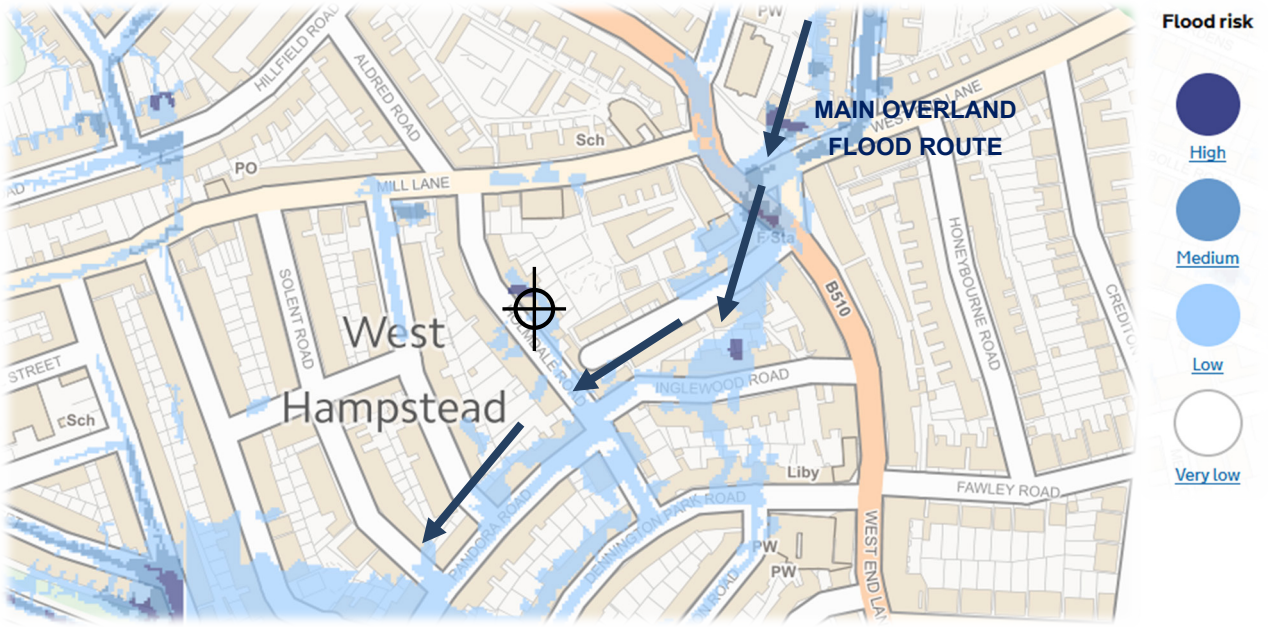
4.2 FLOODING FROM LAND



The Environment Agency (EA) suggests that the site and the surrounding area are at a high risk of surface water flooding.

However, the EA surface water flood map indicates that the site itself is only partially at a Low risk of surface water flooding, which equates to an assessed annual probability (AEP) of flooding of (0.1% to >1.0%) towards the rear garden of the site.

The High risk (AEP >3.3%) is associated with a limited area adjacent to the north of the site at Nos. 21 & 23 Holmdale Road, which appears to be related to the front lightwells. However, the extract below indicates that Holmdale Road itself is at a Low Risk, and that the identified area appears to be associated with a limited overland flow route that joins the main south-westerly flow route that loosely follows the route of the now culverted River Westbourne.



EXTRACT OF EA SURFACE WATER FLOOD RISK (EXTENT OF FLOODING) MAP

Thus there appears to be a possible surface water flood along Holmdale Road itself , flowing towards the south.

Figure 3iv (extract below) shows a similar pattern of flood risk and additionally indicates that Holmdale Roads was recorded as flooding in 2002.

EXTRACT OF FIGURE 3iv OF THE CAMDEN SFRA – FLOOD MAPS FOR SURFACE WATER FLOODING

Hazard mapping created by the EA indicates the hazard to people, as presented by Figure 3ix of the Camden SFRA, following a methodology presented by Defra in the R&D report on Flood Risks to People[1].

The extract below indicates that in the event of a 1 in 1000 rainfall event (<0.1% AEP), the surface water flood hazard to the neighbouring lightwells is classified as Significant.

EXTRACT OF FIGURE 3ix OF THE CAMDEN SFRA – HAZARD: 1 IN 1000 YEAR FLOOD EVENT

[1] *Defra (2006) Defra Guidance Document FD2321/TR2: Flood Risks to People*

4.3 FLOODING FROM GROUNDWATER

Groundwater flooding occurs when water levels within the ground rise above surface levels.

The site is underlain by the London Clay Formation, which the EA classifies as 'Unproductive Strata'.

The intrusive site investigation further confirmed that there is no shallow groundwater table present at the site.

It is therefore concluded that the risk of groundwater flooding at the site is negligible.

4.4 FLOODING FROM SEWERS

Figures 5a and 5b of the Camden SFRA indicate that there a single property has been affected by an internal sewer flooding event within the postcode area of the site and no properties were affected by external sewer flooding events.

EXTRACT OF FIGURE 5a OF THE CAMDEN SFRA – INTERNAL SEWER FLOODING

4.5 FLOODING FROM RESERVOIRS, CANALS AND OTHER ARTIFICIAL SOURCES

The EA's Reservoir Flood Map identifies areas that could be flooded if a large reservoir, canal or other artificial body of water were to fail or release the water it holds. The EA indicates that the site does not lie within an area at risk of reservoir flooding.

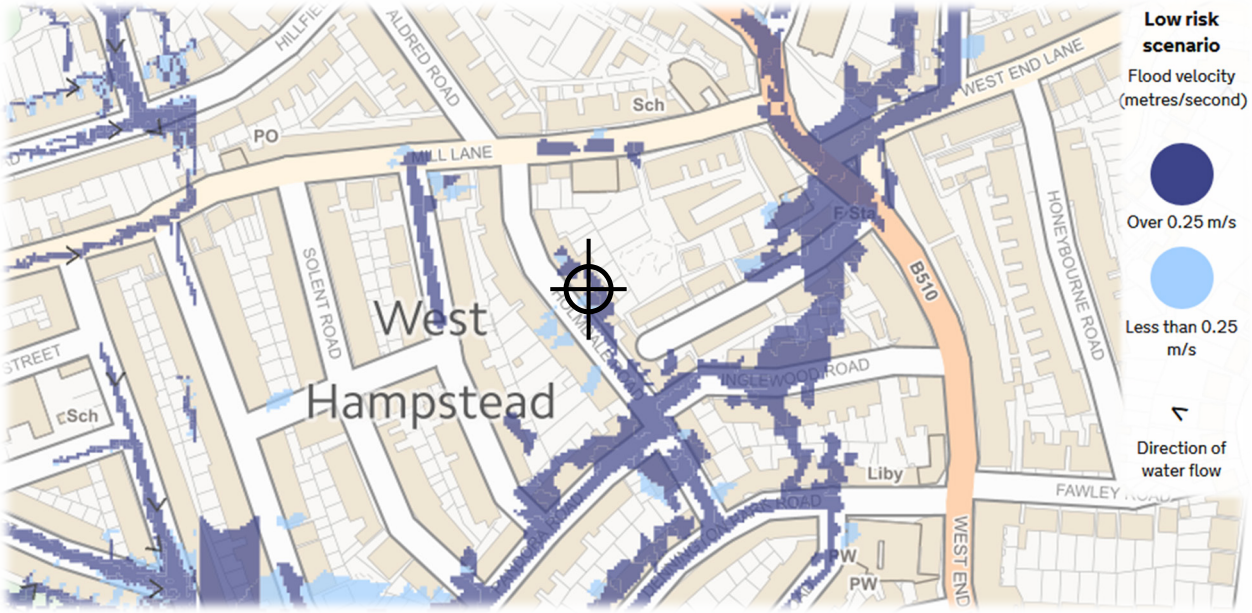
The Camden SFRA has not identified any other significant artificial sources of flood risk within the borough that may adversely affect the site.

5. RISK ESTIMATION

5.1 RATE AND DURATION OF FLOODING

No information is available on the predicted duration of any surface water flooding.

The EA surface water flood map shows that, during a 1 in 1000 rainfall event, the flood velocities may exceed 0.25m/s in the vicinity of the site. A broken flood route is shown as running to the south behind the rear gardens of the terraced properties of Holmdale Road to join the main south-westerly flow route that loosely follows the route of the now culverted River Westbourne.



EXTRACT OF THE EA SURFACE WATER FLOODING MAP SHOWING THE FLOOD VELOCITIES PREDICTED IN THE VICINITY OF THE SITE DURING A 0.1% AEP SURFACE WATER FLOOD EVENT.

The EA surface water flood map further shows that, during a 1 in 1000 rainfall event, the surface water flood depth on the site itself may be expected to be <300mm. Two areas to the north and south may be expected to reach 900mm.

However, as noted previously, the flood water on the site and adjacent areas appears to be associated with water collecting in lightwells rather than any ground level flooding.

EXTRACT OF THE EA SURFACE WATER FLOODING MAP SHOWING THE FLOOD WATER DEPTH PREDICTED IN THE VICINITY OF THE SITE DURING A 0.1% AEP SURFACE WATER FLOOD EVENT.

5.2 CLIMATE CHANGE

5.2.1 ADJUSTMENT FOR POTENTIAL FLOODING FROM THE SEA

The site is not considered to be at risk of flooding from tidal sources and no adjustment is required.

5.2.2 ADJUSTMENT FOR POTENTIAL FLOODING FROM THE LAND AND RIVERS

The predicted effects of climate change – more intense summer rainfall events and high winter fall – could increase the risk of surface water flooding.

The EA flood maps and flood zones do not currently take into account the possible future climate change impacts, although it could be said that the potential extent of an extreme flood shown on flood maps might in future become a more frequent occurrence as a result of climate change.

The EA published revised guidance on climate change allowances for flood risk assessment in 2016, anticipating the total percentage change over the next 100 years. The range for the increase in peak rainfall intensity is estimated between 10% and 40% across England.

6. RISK EVALUATION

6.1 EXISTING SITUATION

The risk of flooding from various sources has been assessed and the overall risk of flooding at this site is indicated to be medium to high.

However, this risk it is interpreted as relating to flooding of lightwells.

The existing ground floor level of the property is set approximately 200mm above the street level of Holmdale Road and is not at present at risk of flooding.

6.2 POTENTIAL SITUATION AFTER DEVELOPMENT

It is proposed to extend and deepen the existing basement area to provide habitable space, including the creation of lightwells and basement level terraces to the front and rear.

A surface water drainage strategy has been prepared to mitigate any risk of flooding as a result of rainwater falling on the site.

However, as a precautionary, flood protection will be required to mitigate the risk of surface water flood ingress to the lightwells, from Holmdale Road and from the adjoining gardens to the north.

7. FLOOD RISK MITIGATION

The surface water flood risk at this site is associated with the ingress of surface water overland flooding to the lightwells. It is therefore suggested that upstands / thresholds are provided around the basement lightwells at a height of say 200mm above street level, i.e. coincident with the ground floor level, in order to obstruct any such flow.

Additionally it is suggested that a non-return valves should be fitted to the sewer connection at the property to protect against sewer flooding.

8. CONCLUSION

This assessment demonstrates that the applicant has considered flood risk to the development from all sources and that the development will be designed to meet the requirements of the EA and the LLFA in terms of development in flood risk areas.

The assessment concludes that the site is indicated to be at a risk of flooding but that this can be mitigated through the introduction of upstands / thresholds around the lightwells.