WATER | ENVIRONMENT

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Our Ref: 17025/KilburnHRFloodRisk/GL
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London Borough of Camden
Planning
5 Pancras Square
Kings Cross
London
N1C 4AG

For the Attention of: David Fowler

Dear David,

246-248 KILBURN HIGH ROAD
STATEMENT OF FLOOD RISK

This letter sets out the risks and consequences of flooding and surface water relating to the proposed development at 246-248 Kilburn High Road in the London Borough of Camden as required following consultation with the London Borough of Camden.

The proposal is to demolish all existing buildings and construct a residential development comprising 27 residential units within two buildings and associated facilities. There are no basements proposed. The site is located within the Kingsgate Local Flood Risk Zone due to surface water flood risks present on Kilburn High Street, and an assessment of flood risk is therefore required to accompany a planning application. The assessment contained herein is undertaken with due consideration of the required standards set out in the National Planning Policy Framework[1] (NPPF) and the latest Planning Practice Guidance for Flood Risk and Coastal Change[2].

DESCRIPTION OF DEVELOPMENT

The Development is located at 246-248 Kilburn High Road. The 0.08ha site is bounded by residential development on two sides. The location and site boundary can be seen in Figure 1.

Figure 1[3] – Location of the Development

[1] Communities and Local Government, National Planning Policy Framework, 2012

[2] Communities and Local Government, Planning Practice Guidance, 2014
http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/ Accessed 15/09/2017

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The site is located to the rear of 250 and 252 Kilburn High Road, with access into the site via an existing opening between 250-252 and 244 Kilburn High Road - a pair of 4-storey semi-detached Victorian blocks of flats with retail units at street level and a vacant office space within a modern terraced block. There is a dwelling occupying the rear (north-east) portion of the site.

A previous planning application (2014/2662/P) at 248 Kilburn High Road to construct 14 dwellings at the site gained approval in January 2015, and is valid for three years. This application is a variation of the proposals to include the land at no. 246.

The proposals include demolition of the existing dwelling on the site and erection of two buildings comprising 27 new residential units. The street block would be built as an infill between numbers 244 and 250 at first floor and above, with access to a courtyard to the rear beneath the proposed block. The second, courtyard block would be located at the rear of the site.

A surface water drainage strategy was undertaken for the proposed development by Water Environment Ltd to deal with the management of surface water runoff. The strategy was agreed by the Lead Local Food Authority in August 2017. This assessment of flood risk therefore focuses on the risk of flooding to the proposed development, and will not consider the proposed surface water drainage except where it is relevant to flood risk management at the site.

TOPOGRAPHICAL SURVEY

According to the topographic survey undertaken by CPB surveys in October 2011, the site is relatively flat with a minimum level on the site of 42.1m AOD at the rear. Ground levels rise towards Kilburn High Road, reaching a peak level of 42.3m AOD on the entrance driveway, before falling again to the road, which is at a level of 42.0m AOD. The site is completely enclosed by buildings, except along the north-western boundary, which is constrained by a continuous brick wall with a top level of 45.1m AOD. This wall ties into the existing buildings. LiDAR data obtained for the area indicates the ground levels on Kilburn High Road descend to the south.

ASSESSMENT OF FLOOD RISK

In assessing the risk of flooding to the site, data from the Environment Agency, Camden Local Flood Risk Management Strategy[4] (LFRMS), Surface Water Management Plan[5] (SWMP) and Strategic Flood Risk Assessment[6] (SFRA) have been used.

Historic Flood Records

According to the LFRMS Figure 5.1, Kilburn High Road was recorded as flooding in the 1975 storm event on 14 August 1975. This was the result of a deluge of 150mm of rainfall in two and a half hours. It is not known whether water flooded onto the site in this event, although the SFRA mapping does not suggest any properties were flooded. The road is not recorded as having flooded in the lesser 2002 event, which, according to the LFRMS, was a 100 year return period event. The SWMP indicates flooding in this area as a result of sewer capacity problems, partly resolved through the Sumatra Scheme.

No further records of the site or Kilburn High Road having flooded in the past were identified.

Risk of flooding from rivers and the sea

The closest source of flood risk arising from rivers or the sea is the River Brent, several kilometres west of the site. The River Thames is situated several kilometres south of the site. The Gov.UK flood map for planning, presented in **Figure 2**, shows that the site is not at risk of flooding from rivers or the sea.

[4] Camden Council, Managing flood risk in Camden – The London Borough of Camden flood risk management strategy, March 2016

[5] Drain London on behalf of London Borough of Camden, Surface Water Management Plan, June 2013

[6] URS on behalf of London Borough of Camden, London Borough of Camden SFRA, July 2014

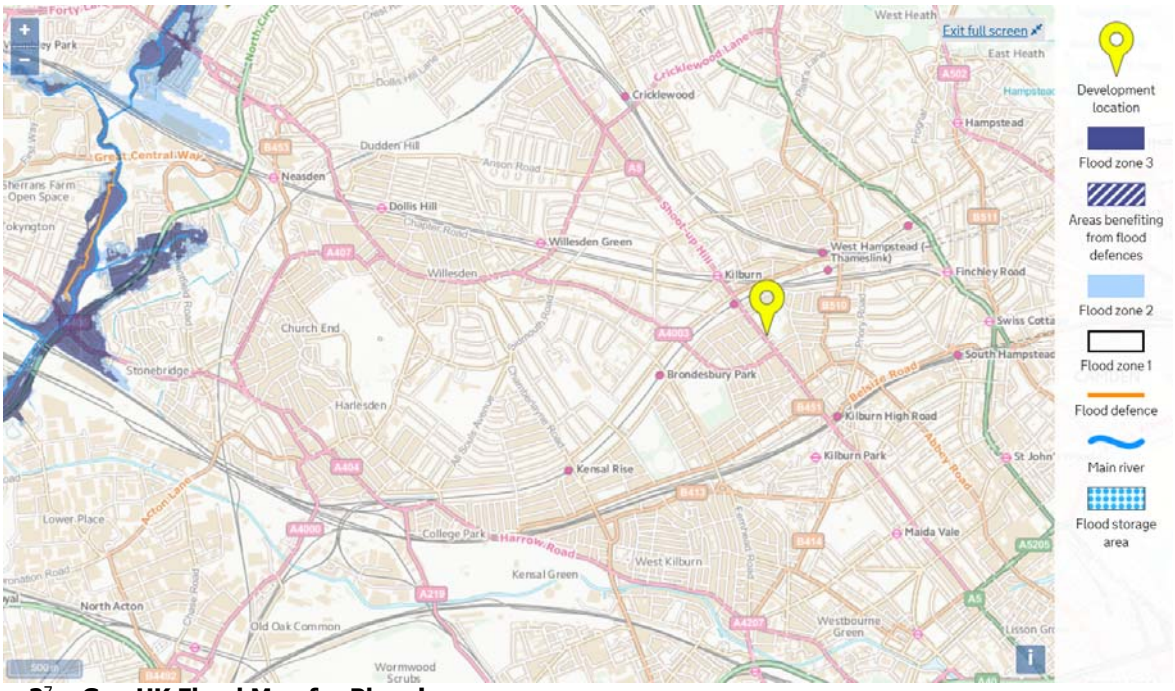

Figure 2[7] – Gov.UK Flood Map for Planning

Risk of flooding from surface water

The dominant source of potential flooding at the site is from surface water. Flooding from surface water arises during intense rainfall events when flood waters are unable to infiltrate into the ground or discharge into local ditches or artificial drainage infrastructure. In an urban environment, the risk of flooding from surface water and from overloaded sewers is closely related, and both are included in the relevant surface water flooding datasets. Flooding events are typically of short duration (unless there is a drainage system blockage), but can be severe.

The site lies within the Camden (West) flood area, where the dominant flow direction for surface water is south-west. The Kingsgate Flood Risk Zone is part of the West Hampstead Critical Drainage Area (CDA) as specified in the SWMP. It is noted that surface water problems in this area have been partly resolved by the Sumatra Road alleviation scheme which provides underground storage of storm water to allow controlled discharge into the combined sewer network. This would at least partially explain why the area did not flood in 2002.

Although the general drainage direction for the area is to the south-west, the SFRA flood risk mapping shows flooding on the site to arise from Kilburn High Road, rather than from the north-east. The site is shown to be at Medium (1 in 100 chance each year) risk.

The Gov.UK long-term flood mapping covers the risks of surface water flooding. In London, these maps reflect the output of the Drain London study undertaken as part of the local authority PFRA. Figure 3 presents the surface water flooding risk map for the area surrounding the site, which is in agreement with the SFRA mapping in indicating that the site is at "medium" risk of flooding, with Kilburn High Road at "high" risk of flooding (greater than or equal to 3.3% chance of occurring in any one year). However, it is noted that the although the area of flood risk shown on the site is contiguous with Kilburn High Road, the continuity occurs via the driveway to the neighbouring site to the north, rather than via the entrance to no. 246-248, which appears to be outside the area shown to be at risk.

[7] © Environment Agency copyright and database rights 2017. © Ordnance Survey Crown copyright. All rights reserved. Environment Agency, 100026380.Contains Royal Mail data © Royal Mail copyright and database right 2017.

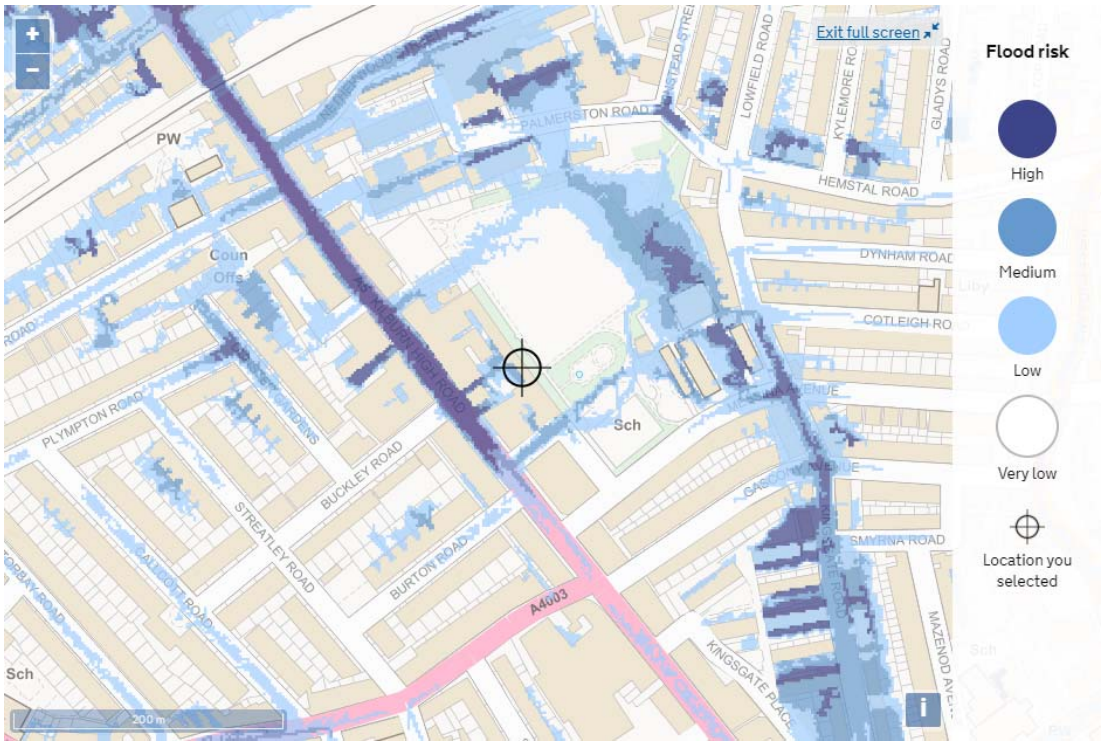

Figure 3 – Gov.UK Long Term Risk Map – Surface Water Flooding Risk

Although this mapping is undertaken at a high level and not with sufficient scrutiny to apply directly on a site-by-site basis, it appears to show that the courtyard area of the site is at "very low" risk of flooding, i.e. less than 0.1% chance in any given year. In addition, water is shown to enter the site via the site to the north-east.

The design event for assessment of flood risk is the 100 year return period, or "medium" chance event. The flood depth map for this event is presented in Figure 4.

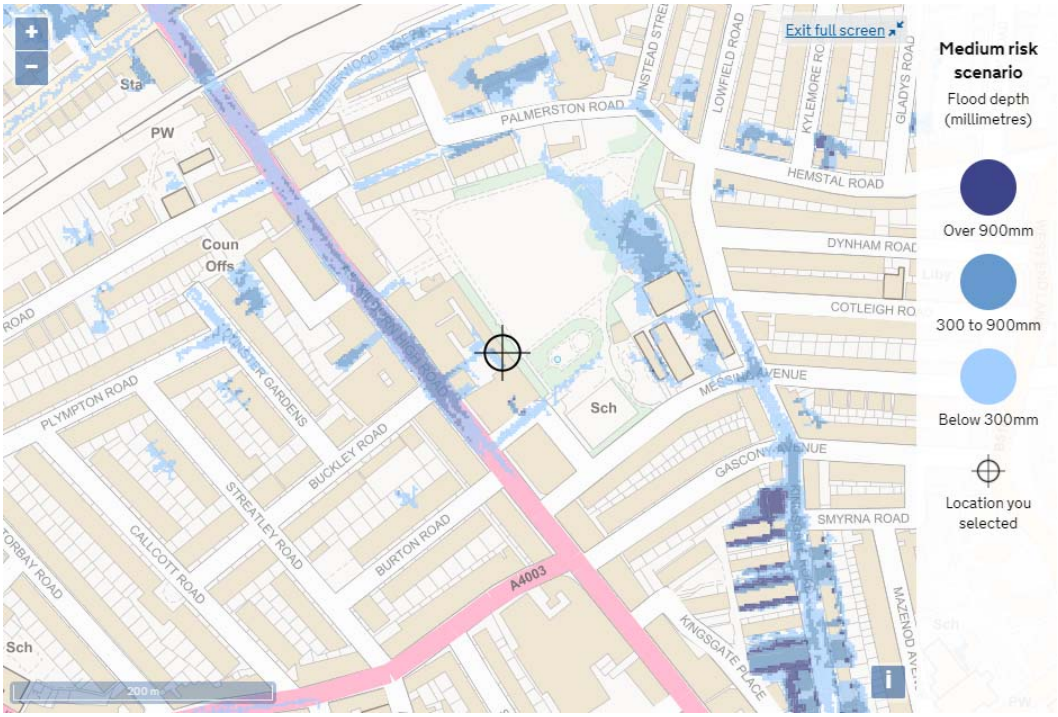

Figure 4 – Gov.UK Long Term Risk Map – Surface water flood depths, Medium Risk scenario

The depth mapping for the medium risk scenario suggests flooding of up to 300mm to the front of the existing building, and at the entrance to the site. Flood depths of 300-900mm are modelled along Kilburn High Road. The main courtyard area of the site is shown dry, suggesting that water levels on the site are no higher than 42.1m AOD. This is also the case in the Low Risk scenario event.

Water is shown to enter the site via the site to the north. This is not possible, since there is a 3m high wall along this boundary which ties into the surrounding buildings, as shown on the topographic survey. The only route for surface water to flood onto the driveway is via the site entrance on Kilburn High Road. Surface water from the road does not flood along the site driveway beyond the buildings at 250 and 252. This is also the case in the Low Risk scenario event. This is in agreement with the topographic survey, which shows levels on the site rising away from the road before dropping again to the rear of numbers 250 and 252.

Therefore, according to the flood risk mapping presented, the site should not experience flooding in the courtyard area during a 1 in 1000 year event, although there is a moderate risk of flooding at the site entrance. This is due to the rise in ground levels at the entrance to the site.

Residual Risk

Although the available data suggest that flooding into the site would not happen in the "Medium" and "Low" chance events due to a lack of available pathways, it would be prudent to include potential flooding into the design of the proposed development. The surface water risk map is undertaken at a high level and is not sufficiently accurate to define risk to the level of confidence on a site specific basis where the margins of error are relatively low. In this case, the difference in ground level on the driveway compared with road levels is 300mm, with predicted depths at the edge of the road of less than, but potentially up to, 300mm. Therefore, if flooding occurred to a greater depth, water could enter the site and potentially cause limited flooding of the courtyard.

The roadside block is located at first floor and above, and is therefore not at significant risk of flooding even in the event of more severe flooding than that shown in the long term risk mapping. However, the courtyard block could be at risk in this scenario.

The proposed ground floor plans for the site show ground levels in the courtyard to be set at 42.40m AOD, with level access into the ground floor of the courtyard block. This is 300mm above the estimated water level as described above, and therefore no flooding would be expected. However, it is recommended by the Environment Agency that a 600mm freeboard is applied for ground floor sleeping accommodation. Given that there is not considered to be a high risk of water flooding onto the site in the design event, it is deemed reasonable that the extra 300mm freeboard would be applied by flood proofing the proposed courtyard block to 42.7m AOD.

Both the 'Preparing for Floods'[8] and 'Improving the Flood Performance of New Buildings'[9] guidance recommends that properties should attempt to exclude flood water (resistance measures) for shallow depths (up to 300mm), since this depth of water generally causes the greatest relative damage to property. A "water exclusion strategy" features low permeability construction materials for the floors and walls (up to 300mm), including the use of materials that clean and dry out easily, such as engineering bricks with water resistant renders.

A surface water drainage strategy that manages rainfall runoff at the site without flooding has already been approved. The building construction should incorporate a water exclusion strategy using the guidance in Chapter 6 of 'Improving the Flood Performance of New Buildings'. The details will be determined as part of the detailed design.

[8] Office of the Deputy Prime Minister (October 2003) Preparing for Floods. Interim guidance for improving the flood resistance of domestic and small business properties.
[9] Communities and Local Government (May 2007) Improving the flood performance of new buildings. Flood resilient construction.

Obstruction of flood flows and displacement of flood water

The water exclusion measures described above are recommended only on the basis of a risk of flooding in events greater than the design event. It has been concluded that flooding of the site is unlikely in the design event due to the slope up into the site and the presence of the boundary walls. Therefore, the proposed development would not obstruct flood flows or displace flood waters.

Safe Access and Egress

Surface water flooding occurs during intense rainfall and consequently is typified by short duration flooding. The site is not considered at significant risk of flooding, however there is a risk of flooding on Kilburn High Road at the entrance to the site. Since the risk of flooding to the buildings are low, there is no imperative for residents to cross flood waters prior to the flood dispersing, except in an emergency. The SFRA includes flood hazard mapping, but only for the 1000 year return period event. Nevertheless, this mapping (Figure 3 x) shows the road outside and to the south of the site to have a hazard rating between "Danger for some" and "Danger for most", indicating that emergency services would be expected to safely access the site during the extreme event.

Risk of Flooding from Sewers

Sewer flooding generally results in localised short term flooding caused by intense rainfall events overloading the capacity of sewers. The Drain London mapping used in the definition of the surface water risk maps used in the SFRA, LFRMS and Gov.UK long term risk mapping include a minimum nominal allowance for sewer capacity, and the risk of flooding from sewers is accounted for within the mapping used to assess the risk from surface water. The independent risk of flooding from sewers is therefore negligible.

Flooding from Groundwater

The Environment Agency online groundwater mapping shows that there are no known aquifers at the site location. The British Geologic Survey (BGS) 1:50,000 scale mapping classifies the bedrock geology as impermeable London Clay. There are no recorded superficial deposits. Local borehole data confirm that the bedrock geology is close to the surface in the area. The ground investigation for the site undertaken in November 2015 found made ground over London Clay. No groundwater was encountered to 15m depth.

Map 4 of the LFRMS Appendix D indicates that the site lies outside of areas considered to be at risk of groundwater flooding. Due to the ground conditions at the site, the risk of flooding from groundwater is negligible.

Flooding from Artificial Sources

The LFRMS indicates that there is a risk of flooding within Camden from the following water bodies:

- Regent's Canal
- Maiden Lane Reservoir
- Hampstead Heath Ponds

The site does not lie downstream of the Regent's Canal, Maiden Lane Reservoir or Hampstead Heath Ponds, and is not at significant risk of flooding from these sources. There are no other sources of flood risk in the Camden area.

Effect on the risk of flooding elsewhere

As previously discussed, the proposed development will not obstruct flood flows or displace floodwaters due to the increased building volume.

The surface water drainage strategy has been undertaken to ensure no increase in surface water runoff from the site following development. This strategy is detailed in the Drainage Assessment submitted with the Planning Application and approved by the LLFA.

The proposed development would not affect the risk of flooding elsewhere.

Summary

This assessment considers the proposed development at 246-248 Kilburn High Road. The proposals modify the existing (2015) approved scheme for the site, increasing the number of residential units. The site is at low risk from all sources of flooding, with the exception of the risk of flooding from surface water.

The site lies within a Local Flood Risk Zone, as a result of historic surface water flooding and the extent of mapped surface water flood risk. Ground levels on the site, together with the presence of boundary walls and buildings, are such that surface water is not expected to flood onto the site in the 100 year return period event according to the Drain London modelling. It is, however, recommended that 300mm of flood resistant construction is included in the design to allow for modelling uncertainty and extreme events above the design flood.

The overall risk of flooding at the site is low. Due to the approved surface water management strategy, the proposed development would not result in an increase in the risk of flooding elsewhere.

Please feel free to contact me if you have any queries.

Yours sincerely,

Guy Laister
Director
MSc Eng BSc Eng (Civil)
CEng CEnv C.WEM MCIWEM