

17 Goldington Crescent, London NW1 1UA : Residential Development
December 2013
Code for Sustainable Homes, Category 4 Flood Risk Assessment

**FLOOD RISK ASSESSMENT REPORT FOR A
RESIDENTIAL DEVELOPMENT AT 17 GOLDINGTON
CRESCENT, LONDON, NW1 1UA**

PREPARED BY

Nimbus
Engineering Consultants

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1 SITE DETAILS

Site Name	17 Goldington Crescent
Site Address	17 Goldington Crescent, London, NW1 1UA
Purpose of Development	Residential
Existing Land Use	Commercial
OS NGR	529620E, 183426N
County	Greater London
Country	England
Local Planning Authority	Camden Borough Council

2 FLOOD RISK






The possible causes of flooding set out in Annex C of Planning Policy Statement 25 (PPS25) are considered in this section in relation to the flood risk to the site itself and the effects of the development of the site on flood risk elsewhere.

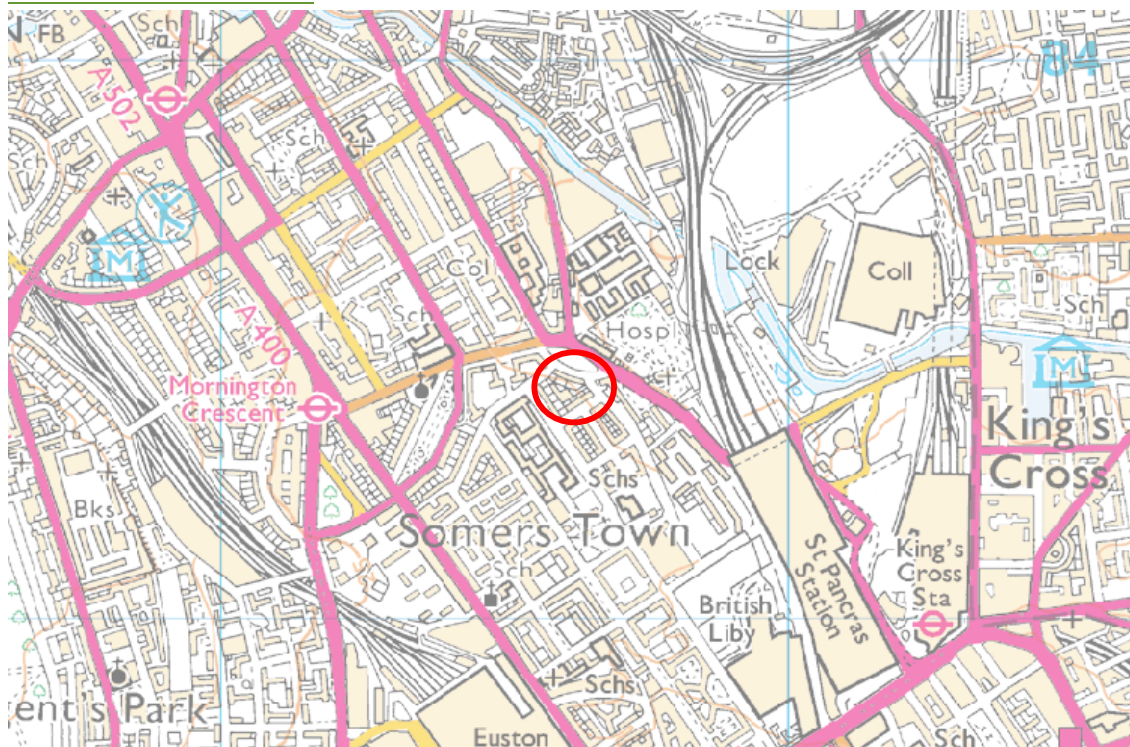
2.1 Flood Zones

The Environment Agency has developed a flood risk map, shown on the next page, which shows the relative risk of flooding for different return periods. Flood zones assume that no defences are present and so where these do exist they are only indicative of the potential for flooding.

The development lies within flood zone 1 of the Environment Agency's flood risk map, as shown below. Land located within flood zone 1 is at low risk of flooding, having an associated annual probability of flooding of less than 1 in 1000.

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-  Flooding from rivers or sea without defences
-  Extent of extreme flood
-  Flood defences
-  Areas benefiting from flood defences
-  Main rivers



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Environment Agency, 100026380.

As can be seen, the site is located within Flood zone 1, and in accordance with table D.1 of PPS25, land within Flood zone 1 is suitable for any use. A formal FRA is not required as the site is below 1ha in size, however, in order to meet the SUR2 requirements of the Code For Sustainable Homes, there is a need to assess the vulnerability of the site to flooding from other sources. Assessment of this site has been based upon the Environment Agency's flood map, the topographical site survey, engineer's drainage layout and the architect's proposed development layout.

Flood Zone Classification	Definition of Zone	Appropriate Uses	FRA Requirements	Policy Aims
Zone 1 Low Probability	This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).	All uses of land are appropriate in this zone.	<p>For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA.</p> <p>This need only be brief unless the factors above or other local considerations require particular attention. See Annex E for minimum requirements.</p>	In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.
Zone 2 Medium Probability	This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.	<p>The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table D.2 are appropriate in this zone.</p> <p>Subject to the Sequential Test being applied, the highly vulnerable uses in Table D.2 are only appropriate in this zone if the Exception Test (see para. D.9.) is passed.</p>	All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.	In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

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<p>Zone 3a High Probability</p>	<p>This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.</p>	<p>The water-compatible and less vulnerable uses of land in Table D.2 are appropriate in this zone. The highly vulnerable uses in Table D.2 should not be permitted in this zone. The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in this zone if the Exception Test (see para. D.9) is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.</p>	<p>All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.</p>	<p>In this zone, developers and local authorities should seek opportunities to:</p> <ul style="list-style-type: none"> i. reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques; ii. relocate existing development to land in zones with a lower probability of flooding; and iii. create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.
<p>Zone 3b The Functional Floodplain</p>	<p>This zone comprises land where water has to flow or be stored in times of flood Local planning authorities should identify in their</p>	<p>Only the water-compatible uses and the essential infrastructure listed in Table D.2 that has to be there should be permitted in this zone. It should be designed and</p>	<p>All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.</p>	<p>In this zone, developers and local authorities should seek opportunities to:</p> <ul style="list-style-type: none"> i. reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques; and

	<p>SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.</p>	<p>constructed to: – remain operational and safe for users in times of flood; – result in no net loss of floodplain storage; – not impede water flows; and – not increase flood risk elsewhere. Essential infrastructure in this zone should pass the Exception Test.</p>		<p>ii. relocate existing development to land with a lower probability of flooding.</p>
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Table 1 – Flood Zones (Information extracted from Table D1 of PPS25)

2.2 Flood Vulnerability

Table 2 below, which has been extracted from Table D2 of PPS25, highlights the flood risk vulnerability of various developments. This information is based partly on DEFRA/Environment Agency research and 'Flood Risks to People' (FD2321/TR2) and also on the need of some uses to keep functioning during flooding.

Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.

The impact of a flood on a particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

Essential Infrastructure	<ul style="list-style-type: none"> Essential transport infrastructure and strategic utility infrastructure, including electricity generating power stations and grids and primary substations.
Highly Vulnerable	<ul style="list-style-type: none"> Police, Ambulance and Fire stations and command centre's and telecommunications installations and emergency dispersal points. Basement Dwellings, caravans, mobile homes and park homes intended for permanent residential use. Installations requiring hazardous substance consent.
More Vulnerable	<ul style="list-style-type: none"> Hospitals, residential institutions such as care homes, children's homes, social services homes, prisons and hostels. Buildings used for dwelling house, student halls of residence, drinking establishments, nightclubs, hotels, and sites used for holiday or short-let caravans and camping. Non-residential uses for health services, nurseries and educations. Landfill and waste management facilities for hazardous waste.
Less Vulnerable	<ul style="list-style-type: none"> Buildings used for shops, financial, professional and other services, restaurants and cafes, offices, industry, storage and distribution and assembly and leisure. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste facilities), mineral workings and processing (except for sand and gravel). Water treatment plants and sewerage treatment plants (if adequate pollution control measures are in place)

Water-compatible Development	<ul style="list-style-type: none"> • Flood control infrastructure, water transmission infrastructure and pumping stations. • Sewerage transmission infrastructure and pumping stations. • Sand and Gravel workings • Docks, marinas and wharves, navigational facilities. • MOD defence installations • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation) • Lifeguard and coastguard stations • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation. • Essential sleeping or residential accommodation for staff required by uses in this category, subject to a warning and evacuation plan.
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Table 2 – Flood Risk Vulnerability Classification

From the flood risk vulnerability classification table (table 2), above, taken from PPS25, residential development comes within the ‘more vulnerable’ classification. However, based on the Environment Agencies flood map, the development site is located within Flood Zone 1 and in accordance with table 3, above, is therefore suitable for any development. Furthermore neither a sequential or exception test is required as a part of this Flood Risk Assessment.

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

Key: ✓ Development is appropriate
 X Development should not be permitted

Table 3 – Flood Risk Vulnerability and Flood Zone Compatibility (Source: Table D3 of PPS25)

3 FLOOD RISK ASSESSMENT

The possible causes of flooding set out in Annex C of Planning Policy Statement 25 (PPS25) are considered in this section in relation to the flood risk to the site itself and the effects of the development of the site on flood risk elsewhere.

3.1 Fluvial or Tidal Flooding

The nearest river to the site is the River Thames, which is 3.5 kilometres south of the site. However any flooding from these does not affect the development site, and the site is also not at risk of tidal flooding, this can be confirmed by the Environment Agency's Flood map in section 2.1.

3.2 Flooding from Land (Overland Flow)

The land at the proposed dwellings is fairly flat and level, as is the land around the site. Consultation with the Building Control and Engineering sections of the Council confirms that there are no specific drainage problems and no history of flooding of the site or in the immediate vicinity. Therefore, it is considered that there is no risk of flooding of the site due to overland flows.

3.3 Flooding from Groundwater

There is no history of groundwater flooding at this site, and the North London Strategic Flood Risk Assessment, produced by Mouchel in August 2008 confirms this, therefore it can be concluded that this site is not at risk of groundwater flooding.

3.4 Flooding from Sewers

This new site drainage has been designed in accordance with Building Regulations Part H, therefore is unlikely to surcharge. Discussions with the Local Authority and water authority indicate that there are no known drainage problems in the area. Therefore, it is considered unlikely that there is any risk of flooding of the site due to surcharge of sewers.

3.5 Flooding from Reservoirs, Canals or Other Artificial Sources

There is no risk of flooding to this site from any reservoirs, canals or other artificial sources in the vicinity of the site. This is confirmed by the Environment Agency's Flood map in section 2.1.

4 MANAGEMENT OF SURFACE WATER RUN-OFF

In accordance with the 'Code for Sustainable Homes Technical Guide, May 2009, Version 2', the following criteria must be adhered to with regards to surface water run-off:

1) Peak Rate of Runoff

Ensure that the peak rate of runoff into watercourses (see definition) is no greater for the developed site than it was for the pre-development site. This should comply with the Interim Code of Practice for Sustainable Drainage systems (SUDS) (CIRIA, 2004) or for at least the 1 year and 100 year return period events.

Where the pre-development peak rate of run-off for the site would result in a requirement for the post-development flow rate (referred to as the limiting discharge) to be less than 5 l/s at a discharge point, a flow rate of up to 5 l/s may be used where required to reduce the risk of blockage.

Following the development of this site, the impermeable areas would have remained the same, therefore the above criteria has been met.

5 CONCLUSIONS

This report considers the flood risk issues arising from the permitted residential development at to 17 Goldington Crescent, London NW1 1UA , all in accordance with Category 4 of the Code for Sustainable Homes to provide the evidence required to gain the mandatory minimum performance standards and additional credits available under the Code.

The site is located within Flood Zone 1, with a less than 0.1% (1 in 1000 year) probability of fluvial flooding. Residential development is designated as 'More Vulnerable' and is considered appropriate in Flood Zone 1. The Local Authority advise that there are no historical records of any flooding to the site.

Due to the topography of the site and surrounding area it is considered that there is no increased risk of flooding of the site due to overland flow, groundwater, surcharging of sewers or other artificial sources.

It is concluded that there would be no flood risk affecting property or the welfare of residents and the public arising from the development of the site and that surface water discharge from the development can be adequately managed to ensure no additional risk of flooding both on site and off site. It is considered that the requirements of Issue ID Sur 2 of Category 4 of the Code for Sustainable Homes have been satisfied and the credits can be awarded.

This report has been written by Sadia Lockett, who has a degree in Civil and Environmental Engineering and has 11 years of experience in working on Flood risk assessments for small site in flood zones 1 to 3, and to larger developments over 1 hectare in flood zones 1 to 3.