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44 Abbey Gardens
St John's Wood London
Flood Risk Assessment &
Surface Water Drainage Strategy

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Client : Dr Chudozie Okongwu

1.1 Introduction

This flood risk assessment (FRA) has been prepared on behalf of Dr ChudozieOkongwu for the proposed buildings works to 44 Abbey Gardens, St Johns Wood, (hereby referred to as the application site).

The purpose of this document is:
▪ To determine and outline potential sources of flooding at the application site, and;
▪ Establish how flood risk will be managed throughout the lifetime of the proposed development, taking into account the potential for climate change.

1.1.2 National and Local Policies

1.1.2 The National Planning Policy Framework (NPPF) states that a site-specific Flood Risk Assessment (FRA) will be required for proposals:

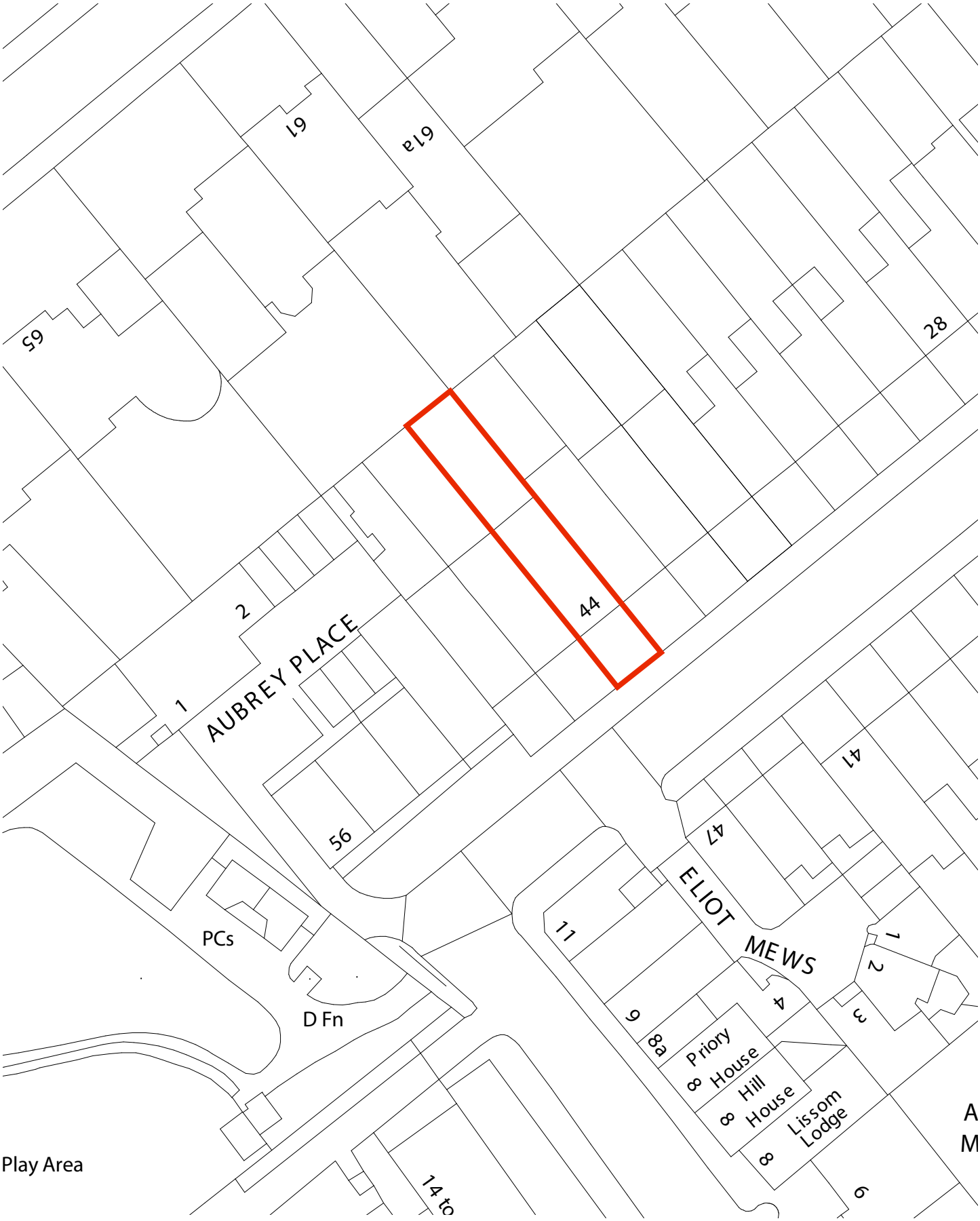
a) that are greater than 1 hectare in area within Flood Zone 1;
b) for all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3;
c) in an area within Flood Zone 1 which has critical drainage problems; and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.
d) in an area within Flood Zone 1 identified in a Strategic Flood Risk Assessment as being at increased flood risk in the future.
e) in an area in Flood Zone 1 that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

1.1.3 The existing and proposed use is C3 residential.

1.1.4 The Local Lead Flood Authority (LLFA) is the City of Westminster Council.

1.1.5 The site falls within a Surface Water Hotspot and the Westminster “Draft Strategic Flood Risk Assessment 2019” (SFRA) states that for “development in an area within Flood Zone 1 which has critical drainage problems as notified by the Environment Agency, or within a Surface Water Hotspot”, a site-specific Flood Risk Assessments (FRAs) will need to be prepared by prospective developers.

1.1.6 The site is located wholly within Flood Zone 1 and is less than 1.0ha, but by virtue of its location with a Surface Water Hotspot area and hence an area subject to critical drainage problems, an FRA would be required.


61
61a
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1
AUBREY PLACE
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ELIOT MEWS
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Play Area
Priory House
Hill House
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0 5 10 25 50 m

2.1 The Site, 44 Abbey Gardens, NW8

St John's Wood is to be found in the north west part of the City of Westminster, Traditionally the northern part of the ancient parish and Metropolitan Borough of Marylebone, it extends east to west from Regent's Park and Primrose Hill to Edgware Road, with the Swiss Cottage area of Hampstead to the north and Lisson Grove to the south.
Abbey Gardens lies to the west of the St John's Wood Conservation Area, running off Abbey Road and adjacent to Violet Hill Gardens and playground. No. 44 Abbey Gardens forms a terrace of buildings constructed circa 1860, that is Grade II listed.

The construction work proposed that alters the fabric of the building is limited to the lower ground floor and front garden. The upper floors are in fairly good decorative order and the only works proposed is a 'fresh-coat' of paint to principal rooms on the upper floors.

Aerial photograph of application site, scale approx. 1:1250

2.2 Existing Drainage and Hydrology

2.2.1 There are no watercourses in or immediately adjacent to the site.

2.2.2 The site consists of a mid-terrace property with mixture of hard paved surfaces and soft landscaping.

2.2.3 The underlying ground conditions are shown as London Clay Formation - Clay, Silt and Sand, Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period with no superficial deposits recorded.

2.2.4 Soilscapes categorises the underlying soils as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils with impeded drainage.

2.3 Development Vulnerability and Flood Zone Classification

National Planning Policy Framework (NPPF)

2.3.1 Local Planning Authorities, (LPA) have a statutory obligation to consult the Environment Agency, (EA) on all applications in flood risk zones. The EA will consider the effects of flood risk in accordance with the NPPF.

2.3.2 NPPF requires that, as part of the planning process:

- A ‘site specific’ Flood Risk Assessment will be undertaken for any site that has a flood risk potential.
- Flood risk potential is minimised by applying a ‘sequential approach’ to locating ‘vulnerable’ land uses.
- Sustainable drainage systems are used for surface water disposal where practical.
- Flood risk is managed through the use of flood resilient and resistant techniques.
- Residual risk is identified and safely managed.

2.3.3 Table 1 of NPPF, categorises flood zones into:

- Zone 1- Low probability (< 1 in 1000 years)
- Zone 2- Medium probability (1 in 1000 - 1 in 100 years)
- Zone 3a- High probability (> 1 in 100 years)
- Zone 3b- The functional floodplain (>1 in 20 years)

2.3.4 NPPF also categorises types of development into Flood Risk Vulnerability groups. Residential use is classified within the NPPF as being ‘more vulnerable’.

2.3.5 The proposed development is for residential use. The Site is located entirely in Flood Zone 1 and therefore, the exception test will not be required under NPPF and requirements of the SFRA.

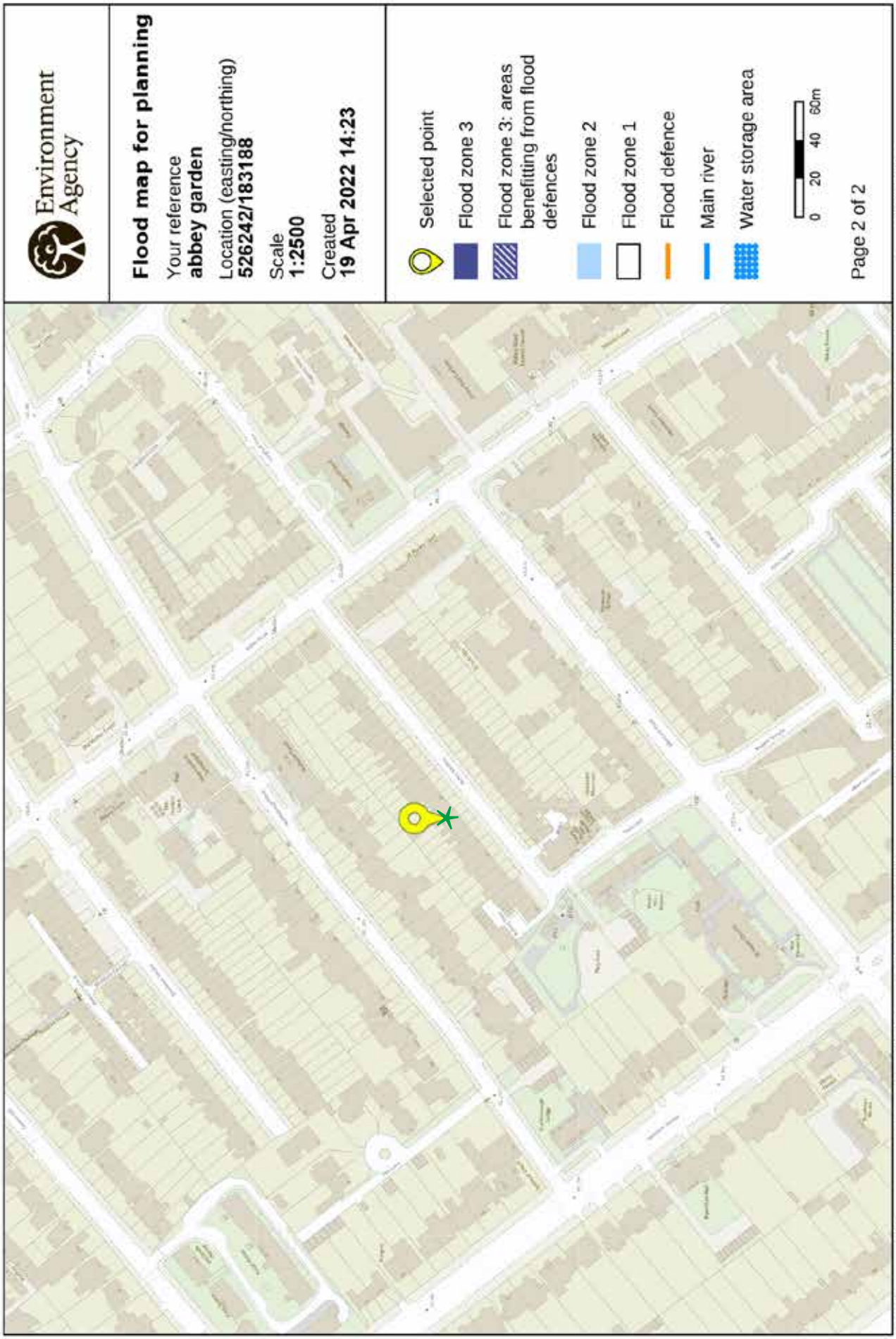

Fig. 1 Envrionmental Agency flood zone map, showing site is within flood zone 1. 44 Abbey Gardens site

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

Table 1, NPPF Guidance

Fig. 2 City of Westminster City Plan 2019-2040 (April 2021), Surface Water Hotspot
✱ 44 Abbey Gardens site

3.0 Site Specific Flooding Issues

3.1 Local Planning Authorities, (LPA) have a statutory obligation to consult the Environment Agency, (EA) on all applications in flood risk zones. The EA will consider the effects of flood risk in accordance with the NPPF.

3.2 In accordance with the National Planning Policy Framework, this Flood Risk Assessment considers all sources of flooding including:
a) Tidal Flooding – from sea;
b) Fluvial Flooding – from rivers and streams;
c) Pluvial Flooding – overland surface water flow and exceedance;
d) Historic flooding – known historic flooding issues;
e) Groundwater flooding – from elevated groundwater levels or springs;
f) Flooding from sewers – exceedance flows from existing sewer systems; and
g) Artificial sources – reservoirs, canals etc.

Surface Water Hotspot
3.3 The site lies with a Surface Water Hotspot as shown on the City of Westminster City Plan 2019-2040, (Fig. 2).

3.4 A 'Hotspot' (also known as flood prone areas) are defined as locations where concentrations of flooding incidents within a limited geographical context have appeared over time.

3.1 Tidal Flooding

3.1.1 The Environment Agency website provides basic flood mapping data as a general guide to whether a site is at risk of flooding from various sources including rivers and seas for Flood Zoning classification.

3.1.2 This mapping (Figure 4.1) indicates that the site is wholly located within Flood Zone 1, an area with a low probability of flooding occurring.

3.1.3 The site is also situated well beyond the Maximum Tidal Breach Flood Extent 2100 as assessed by the Thames Tidal Upriver Breach Inundation Assessment (May 2017) recorded in the SFRA.

3.1.4 Given the above the risk to the site from this source of flooding is considered to be Low.

3.2 Fluvial Flooding

3.2.1 There are no recorded instances of flooding occurring from this source.

3.2.2 Given the above Fluvial Flood risk to the site is Very low risk means that each year this area has a chance of flooding of less than 0.1%.

3.3 Pluvial Flooding

3.3.1 The Surface Water (Pluvial) Flood Map (Fig. 3) indicates that the property itself is at a very low risk due to surface water flooding meaning that each year it has a chance of flooding of less than 0.1%, though it is recognised that the surrounding area is subject to some small pockets of land shown to be at higher risk.

3.3.2 The Westminster Initial Assessments Study contained within the SFRA indicates that the existing property is not subject to flood risk due to a 1% AEP rainfall event.

3.3.3 The property is also not indicated within the Westminster Initial Assessments study (WSP 2015) as subject to predicted surface water flood risk in Westminster in 2115 for a 20% and 40% increase in peak rainfall intensity in the 1% AEP rainfall event.

3.3.4 The development itself is therefore considered to be at very low risk of flooding from surface water flows, though it recognised that the wider area will be subject to somewhat higher risk located within the flooding Hotspot.

Fig. 3, Environment Agency Surface Flooding Map
City of Westminster Initial Assessments Study contained within the SFRA indicates that the existing property is not subject to flood risk due to a 1% AEP rainfall event.

3.4 Groundwater Flooding

3.4.1 The underlying strata, as derived from the BGS data indicates that the site has bedrock deposits recorded as London Clay Formation but does not give any indication as to susceptibility to groundwater flooding.

3.4.2 The risk of groundwater flooding in Westminster is considered to be low. In Westminster the chalk aquifer of London is fully concealed under a layer of London Clay, which does not allow groundwater in the chalk aquifer to reach the ground surface. Above the London Clay, there are gravels, alluvium, and made ground, and the water contained in these superficial deposits, ultimately derived from rainwater, acts as the source of perched groundwater flooding when insufficiently drained

3.4.3 The Westminster Preliminary Flood Risk Assessment (Halcrow 2011) included within the SFRA shows that the property is however not in an area with increased potential for elevated groundwater.

3.5 Flooding from Sewers

3.5.1 It is currently unknown where existing sewers are located adjacent to the site, though it is likely that the site currently drains to combined sewers located in Abbey Gardens, and it is expected that any overland flood flows from adjacent sites would be intercepted by the existing highway and adopted network.

3.5.2 It is recognised however that due to the heavily urbanised nature of Westminster, and the predominantly Victorian drainage infrastructure, there is a widespread risk of surface water flooding.

3.5.3 The risk of sewer flooding to the site is therefore considered to be medium.

3.6 Flooding from Artificial Sources

3.6.1 From the EA map there are no reservoirs or canals in the immediate vicinity of the site. The nearest main watercourse is the Grand Union Canal located approximately 1km to the south.

3.6.2 Therefore, the development is considered to be at Very Low risk of flooding from reservoirs, canals and artificial sources.

4.0 Climate Emergency

4.1. Anticipated Development Lifecycle
In accordance with the PPG, NPPF and best practice, a 100 year development lifecycle has been assumed for the proposed works to the buildings.

4.2. Climate Change Allowances
EA guidance “Flood Risk Assessments: Climate Change Allowances” (2016) outlines the required climate change allowances to be adopted when interrogating existing flood data and for use in the design of future surface water drainage systems. A climate change allowance of 40% has and will be adopted in the interrogation of peak river flow allowances, in accordance with Table 1.
Table 2 of the same document also outlines that a 40% climate change allowance should be adopted for all peak rainfall intensities for the purposes of new surface water drainage design. This again assumes the ‘upper end’ value and a 100-year development lifecycle.

4.3. Impacts on Flood Risk
SFRA and EA mapping confirms the site remains unaffected by fluvial flooding up to and including the 1% (1:100 year) AEP event, including an allowances for climate change. And the surface water flooding maps including a 40% allowance for climate change have also been reviewed as part of the earlier sections.

4.4. Impacts on Proposed Surface Water Drainage Design
The impact of climate change over the lifetime of the development will be taken into account within the assessment of post-development surface water runoff and subsequent design of surface water drainage systems for the proposed extension.

5.0 Proposed drainage strategy

5.1 The proposed building works consists of a minor alteration to the external areas of the property. To the front, this will include a net reduction in the hard permeable paved areas returning current hard paving to soft landscaping and garden. There are no other changes to the rear of the property.

5.2 The net result is that there will be no overall appreciable change in the extent of impermeable areas within the site boundary, and with a slight decrease.

5.3 Aside from localised changes to surface water collection measures within the site boundary, the existing draining will remain largely unchanged.

5.4 Given the extent of proposed changes and the minimal reduction upon impermeable areas, it is expected that there would be no appreciable difference in surface water conditions as a result of the proposed development.

6.0 Conclusion

6.1 The site consists of a mid-terrace period property with mixture of hard paved surfaces and soft landscaping.

6.2 The site is shown on the EA flood maps as being within Flood Zone 1, but within Surface Water Hotspot as shown on the City of Westminster City Plan 2019-2040.

6.3 The individual property is not subject to any apparent or significant flood risk issues, though it is recognised that other properties in the wider area will be subject to somewhat higher risk.

6.4 The proposed development consists of a minor reconfiguration of external areas to the property, but with minimal increase in soft landscaped areas.

6.5 In respect of flooding and surface water drainage, net changes as a result of the proposed development will be negligible.

7.0 Sources of Information

Information relating to the flood risk at the site at the time of writing has been obtained from:
- The Environment Agency (EA) website;
- City of Westminster Strategic Flood Risk Assessment (SFRA) Level 1 (April 2019);
- City of Westminster (Draft) Surface Water Management Plan (2011)
- City of Westminster Preliminary Flood Risk Assessment (2011) & update (2017)
- City of Westminster Local Flood Risk Management Strategy 2017-2022 (2017)
- Mayor of London’s Regional Flood Risk Appraisal (RFRA).