F Flood Risk Assessment

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12 Pilgrim's Lane, Camden, NW3 1SN

Flood Risk Assessment

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		Remarks:	Issued for Planning				
Revision:	P1	Prepared by:	Mike Ash MEng (Hons)	Checked by:	Keri Trimmer BEng (Hons) MSc CEng MICE	Approved by:	Keri Trimmer BEng (Hons) MSc CEng MICE
Date:	29/06/2022	Signature:		Signature:		Signature:	

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Appendices

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One

Executive Summary

The proposed development is located at 12 Pilgrim's Lane, NW3 1SN in the London Borough of Camden.

Flood zone information published by GOV.uk shows that the development is located within Flood Zone 1, and is therefore at very low risk of fluvial flooding. However, it is located in a critical drainage area.

A review of all other potential sources of flooding has found the site to be at low risk, providing a suitable drainage scheme is in place.

This report demonstrates that the proposed development has a low probability of flooding. It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework, London Plan and local policy.

Two

Introduction

Elliott Wood Partnership Ltd have been appointed to produce a Flood Risk Assessment in support of the proposed redevelopment of 12 Pilgrim's Lane.

The Site is located within the London Borough of Camden (LBC) who are also the Lead Local Flood Authority (LLFA).

This FRA will assess the risk of flooding to the site and review the impact the proposed development will have with regards to flood risk to surrounding properties. This is in line with the requirements of the National Planning Policy Framework (NPPF).

The Flood Risk Mechanisms being considered as part of this Flood Risk Assessment (FRA) are as follows:

- Rivers and Sea
- Overland Flow
- Flooding from Artificial Waterbodies
- Infrastructure Failure / Sewer Flooding
- Groundwater

Three

Site Context

3.1 Site Location

The site is located in Hampstead Town within the London Borough of Camden. The site is bounded by Pilgrim's Lane to the west and private residential developments to the north, east and south. The closest stations to the site are Hampstead Underground Station, which is approximately 575m to the west and Hampstead Heath Overground Station which is located 675m to the east. The site is located within the Hampstead Conservation Area.

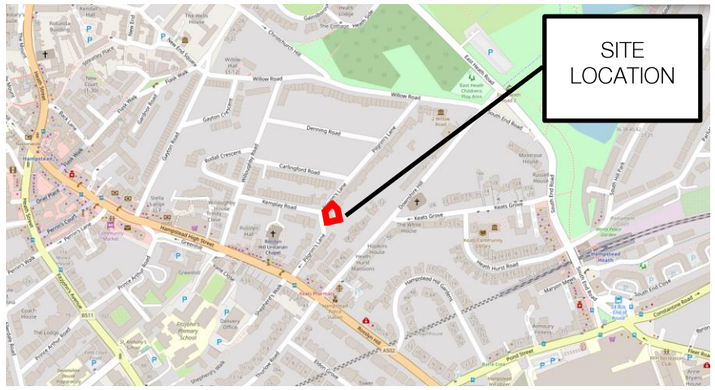

Figure 1: Site Location Plan

The site centred OS grid reference is 526850E: 185679N and the total site boundary is approximately 785m^2 (0.0785ha).

3.2 Existing Development

The building is a two-storey high semi-detached residential building, oriented south to north. The site includes a garden east, west and south of the building.

Figure 2: Existing Site Plan

3.3 Topography

A Measured Building Survey was undertaken by target surveys in September 2021.

External levels show that the site is largely flat but with differing topographical features on the west and east sides of the building. The westside falls to the southeast towards the building, with levels starting at 99.90 mAOD and falling to 99.70 mAOD. The eastern side has a fall to the southeast away from the building, with levels starting at approximately 97.55 mAOD and falling to approximately 97.25 mAOD at the boundary of the garden.

The measured building survey can be found in **Appendix A.**

3.4 Proposed Development

It is proposed that the site will undergo an internal and external refurbishment with a new lower ground floor being added to the building to provide approximately 205m^2 additional floor area. This area will contain a pool, plant room, gym and new bedroom.

Figure 3: North Elevation of the Proposed Development

The proposed masterplan for the development can be found in full within **Appendix B.**

Four

Planning and Flood Risk Policy

4.1 Policy Summary

The following documents have been reviewed in preparation of this flood risk assessment:

- London Borough of Camden Strategic Flood Risk Assessment (SFRA) 2014
- London Borough of Camden Surface Water Management Plan (SWMP) 2011
- The London Plan 2021
- GOV.uk flood risk maps

4.2 Sequential and Exception Test

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. While developments in Flood Zone 1 don't typically require a site-specific flood risk assessment, the site is contained within the Critical Drainage Area (CDA) Group3_010.

In accordance with Table 2: Flood risk vulnerability classification of the Planning Practice Guidance: Flood Risk and Coastal Change, the proposed development is classified as "more vulnerable" as it is a residential development.

In accordance with Table 3 of the Planning Practice Guidance: Flood Risk and Coastal Change, the sequential test is passed, as the exception test is <u>not</u> required for "more vulnerable" developments within Flood Zone 1.

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Five

Flood Risk Assessment

It is important to assess the flood risk posed to the development of this Site from all sources of flooding, in accordance with National Planning Policy Framework (NPPF) requirements.

The flood risk mechanisms being considered as part of this Flood Risk Assessment (FRA) are as follows:

- Fluvial and tidal sources;
- Surface water;
- Groundwater;
- Flooding from Artificial Waterbodies; and
- Sewer and Infrastructure Failure

5.1 Flooding from Fluvial and Tidal Sources

In accordance with the GOV.uk flood maps for planning, the Site is in Flood Zone 1 - land and property assessed as having less than a 0.1% (1 in 1,000) annual probability of river or sea flooding in any given year.

Figure 4: GOV.UK Flood Map for Planning – Flood risk from rivers or the sea

Therefore, the risk of the development flooding from rivers and sea is **very low**.

5.1.1 Critical Drainage Area

A critical drainage area is defined by the London borough of Camden's Strategic Flood Risk Assessment as "A discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during sever weather thereby affecting people, property or local infrastructure."

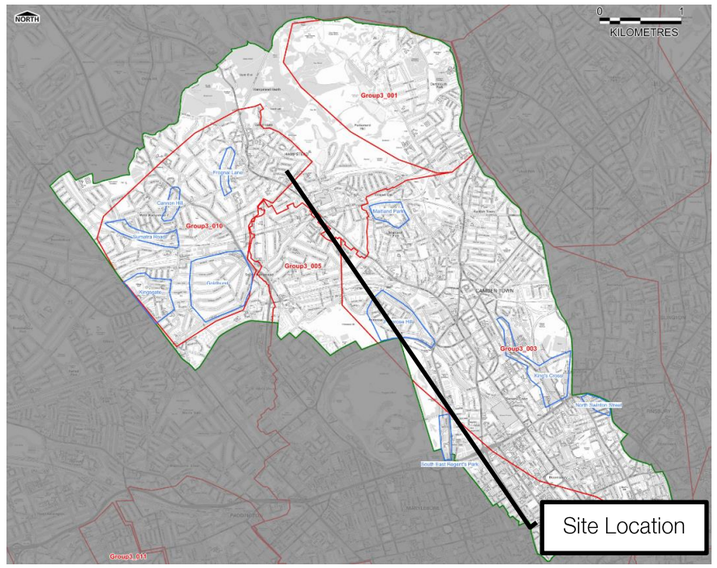

Figure 5: London Borough of Camden SFRA – Critical Drainage Area

The site resides within the catchment of critical drainage area Group3_010.

5.2 Flooding from Surface Water

Surface water flooding occurs when intense rainfall is unable to soak into the ground or enter drainage systems, because of blockages, or breakages in water pipes or where the drainage capacity has been exceeded. The extent of surface water flooding will depend upon the rainfall event, the degree of saturation of the soil, the permeability of soils and the topography of the site.

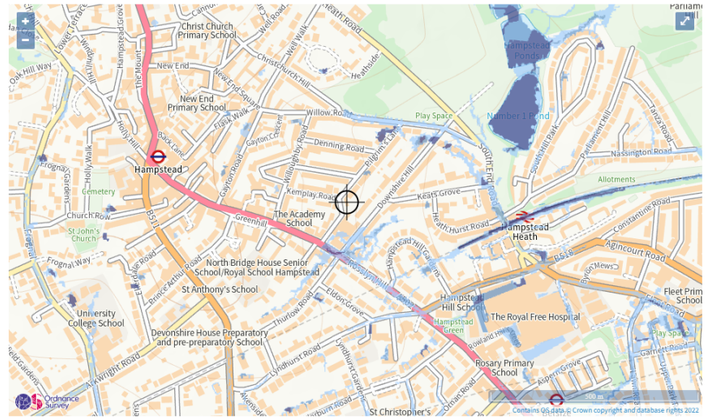

Figure 6: GOV.UK Flood Map for Planning – Flood risk from surface water

A review of the GOV.uk flood risk from surface water map indicates that the site is at 'very low' risk of surface water flooding.

Levels on site will be designed to route surface water away from building edges and thresholds. This will increase the buildings resilience to flooding from overland flow.

After review of the relevant information, the risk of flooding from overland surface water flow is considered to be **very low**.

5.3 Flooding from Groundwater

Groundwater flooding can occur following an extended prolonged period of low intensity rainfall. The future risk from this source is more uncertain than surface water as the climate change predictions indicate that although sea levels will rise, thus possibly raising groundwater levels, overall summer rainfall will decrease, therefore having a long-term effect of lowering the groundwater levels. However, long periods of wet weather are predicted to increase, and these are the type of weather patterns that can cause groundwater flooding to occur.

A review of the BGS maps show the site straddles the boundary between an area of Claygate member and an area of London Clay member with no superficial deposits recorded. There are a number of historical boreholes near the site. The boreholes indicate layers of made ground over London clay which is over Thanet sand and chalk.

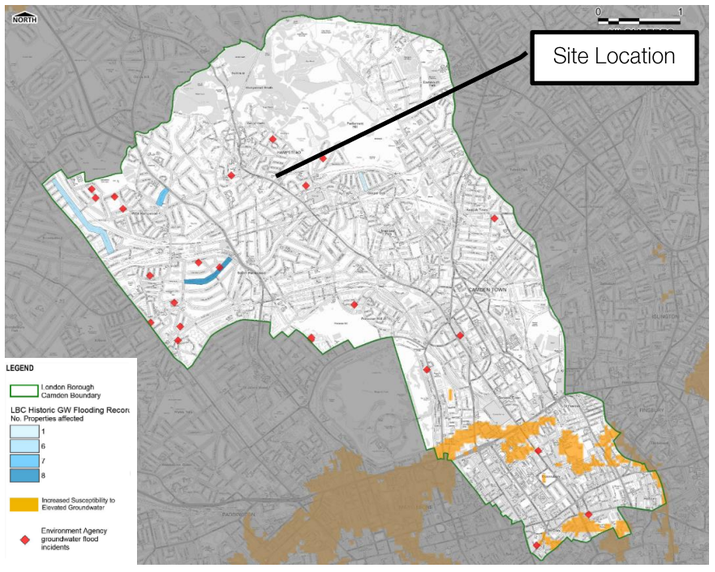

Figure 7: London Borough of Camden SFRA – Increased Potential for Elevated Groundwater

As can be seen in Figure 7, the site is located outside of an area of increased potential for elevated groundwater and therefore is not at an elevated risk of groundwater flooding.

The risk of flooding from groundwater is therefore considered to be **low**.

5.4 Flooding from Artificial Water Bodies

Review of the GOV.uk flood risk from reservoirs map indicates that the site is not located within a reservoir Flood Risk Zone (an area expected to flood if a local reservoir were to fail or be breached).

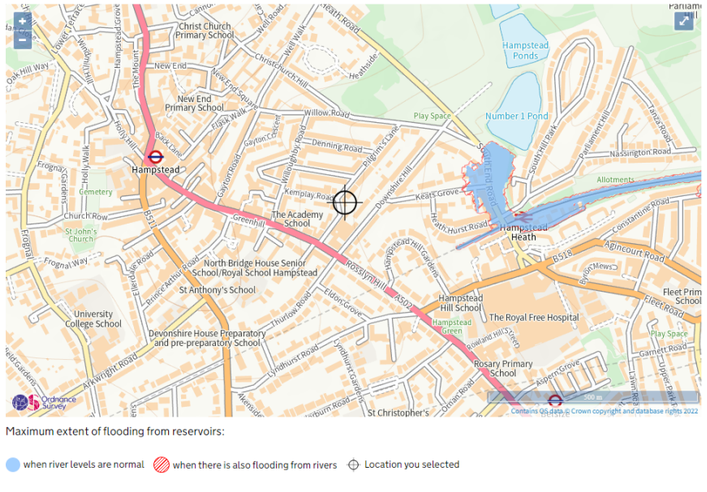

Figure 8: GOV.UK Flood Map for Planning – Flood risk from reservoirs

Following review of the relevant information, the risk of flooding from artificial water bodies is considered to be **low**.

5.5 Flooding from Infrastructure / Sewer Failure

Public sewer records have been obtained from Thames Water. The records show a 940x635mm diameter combined sewer located under Pilgrim's Lane headed northwards. Another 305mm diameter combined sewer is located under Pilgrim's Lane that travels south.

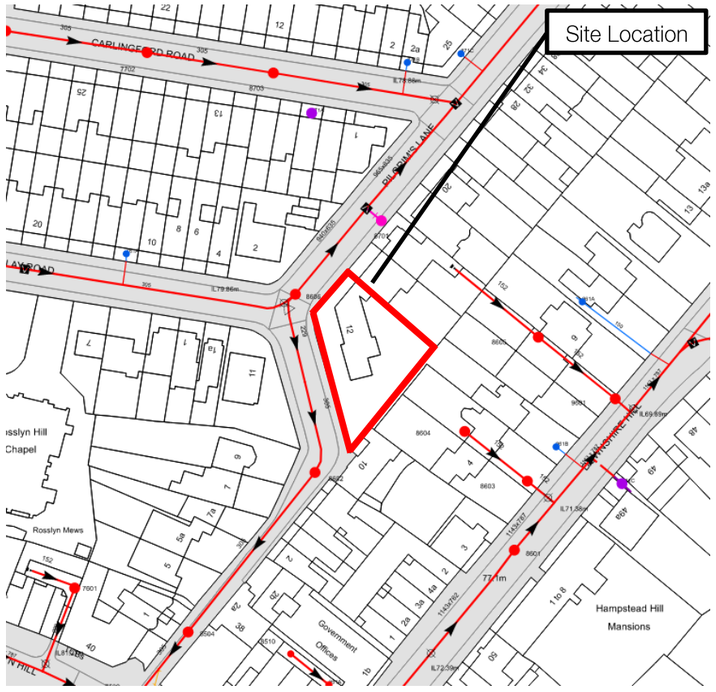

Figure 9: Thames Water – Sewer Records

Thames Water are responsible for operating and maintaining their sewer infrastructure, therefore the likelihood of surcharge due to blockages is expected to be low.

According to Camden's internal sewer flooding and external sewer flooding maps there have been 4 and 1 incidents respectively of recorded flooding from sewers in the postcode area of NW3 1.

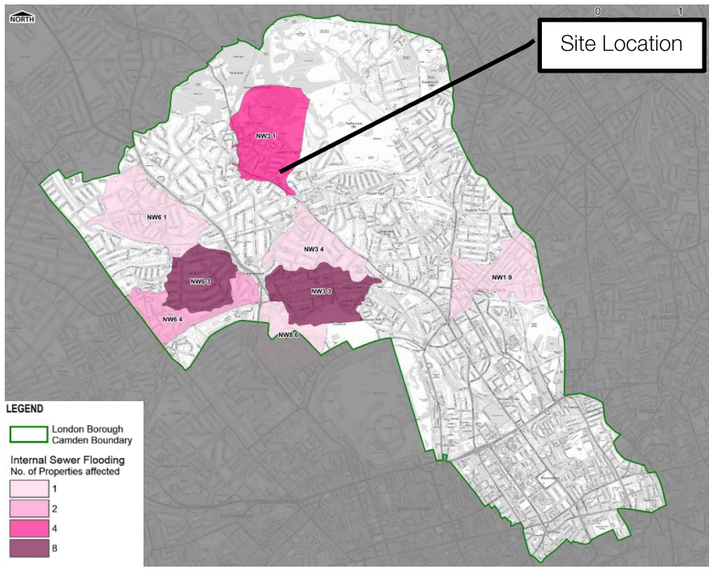

Figure 10: London Borough of Camden SFRA – Internal Sewer Flooding

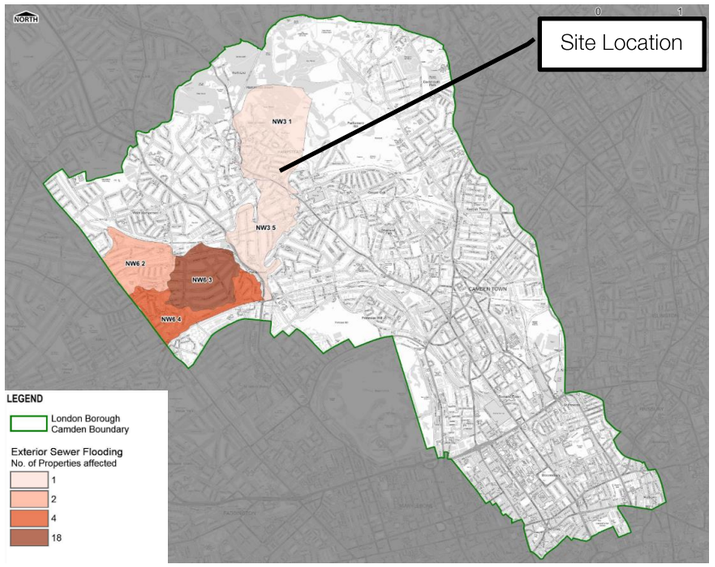

Figure 11: London Borough of Camden SFRA – External Sewer Flooding

As a result, the risk of flooding from infrastructure and sewer failure is considered to be **low**.

Six

Conclusion

A review of all potential sources of flooding has found the site be at low risk of flooding. The new proposed drainage network should ensure that the building remains safe from flooding in the event of a localised drainage failure. In addition, levels across the site should ensure that surface water is directed away from building thresholds.

Refer to **Appendix C** for the London Borough of Camden Flood Risk proforma

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Sub-Appendices

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A Sub-Appendix
Topographical Survey

Omitted to avoid duplication

B Sub-Appendix
Proposed Development Drawings

Omitted to avoid duplication

Sub-Appendix

C London Borough of Camden Flood Risk Pro-Forma

Pro-forma for any schemes in flood risk areas & all major development - Camden LLFA

All yellow boxes **must** be completed on this and all relevant tabs
Complete peach cells with source document and section/page references, required to support/justify responses
Do not edit grey cells
Please note guidelines / notes in column M
Complete all relevant tabs

Introduction: This Proforma is intended to help you understand the Sustainable Drainage and Flood Risk considerations that the Lead Local Flood Authority (LLFA) and Local Planning Authority (LPA) will take into account when considering an application in Camden, as well as helping us to consider the application. This does not replace the need also to provide where required a Drainage Statement, Flood Risk Assessment, and GLA-Camden SuDS Pro-forma, and observe the detailed guidance in ' Camden Planning Guidance (CPG) Water & Flooding'. Any information provided should be referenced to the relevant section of submitted supporting documents. This summary page will help provide key details on the application. Note that certain cells on this and other tabs will be populated automatically from previous answers given.

A. Application details

Planning reference (if known)				
Scheme name	12 Pilgrim's Lane			
Scheme address	12 Pilgrim's Lane, Camden			
Postcode	NW3 1SN			
Scale of development as registered	Minor			
Scale - policy subcategory	Minor - other	Residential parts		Non-residential parts
Type(s) of development	Residential	New/re-build		
Site area, hectares	0.0785	*100%*		
Of which total permeable area, to nearest 0.0001 ha	0.0455	58%		
Of which total impermeable area, to nearest 0.0001 ha	0.033	42%		

	Existing	Proposed				
	TOTAL pre-development	For demolition	New-build incl. infills, re-build, extensions	Retained (refurbished or change of use)	TOTAL post-development	Net UPLIFT post-development
Total floor area of development (GIA)	192		62	192	254	62
of which residential	192		62	192	254	62
of which non- residential					0	0
Number of residential units						
List all use class(es)						

Drainage Statement document details	2210419-EWP-ZZ-XX-RP-C-0002, Mike Ash, 29/06/2022, P1
Flood Risk Assessment document details	2210419-EWP-ZZ-XX-RP-C-0001, Mike Ash, 29/06/2022, P1

B. Flood Risk and SuDS - Policy & Documents Filter

Recommendation (Council to complete)			
	Site area 1 hectare or greater?	*No*	
	Major application?	*No*	
	In Critical Drainage Area?	Yes	
	In or bordering (<50m) Local Flood Risk Zone(s)?	No	
	Name of LFRZ(s):		
	On Historically Flooded Street 1975 or 2002?	No	
	Name of HFS(s):		
	Area at risk of flooding (surface water)?	*No*	
	Elevated groundwater susceptibility or <50m of GW in	No	
	In area with recorded sewer flooding incident?	Yes	
	In street with historical underground watercourse?	No	
	Area at risk of flooding (other relevant types)?	*Yes*	
	Basement proposed - new, enlarged or change of use	Yes- enlarged	
	IF YES, list proposed basement uses (all spaces):	Bedroom, pool, plant room	
Approve/Condition/Refuse	*IF YES, are habitable or vulnerable use(s) included?*	Yes	
Approve/Condition/Refuse	*IF NO, is other (non-basement) vulnerable developm*		
	Vulnerable development in flood-prone area?	*Yes*	
	Site-specific Flood Risk Assessment (FRA) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Site-specific FRA submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Drainage Statement (DS) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	DS submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Sustainable drainage (SuDS) proposals required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	SuDS proposals submitted?	Yes	**If Yes, go to SuDS Proposals tab**
	FRA/DS/SuDS supporting evidence required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Supporting evidence submitted?	Yes	**If Yes, go to Flood Risk Proposals &/or SuDS Proposals t**

Flood Risk Assessment, Proposals & Evidence

Recommendation (Council to complete)	**Assessments**	Required?	Document submitted?	Document title	Page/ section reference	**Guidelines / notes**
	Site-specific Flood Risk Assessment	*CHECK SITE DETAILS*	*Yes*	2210419-EWP-ZZ-XX-RP-C-0001	Section 4	Policy CC3 c. consider the impact of development in areas at risk of floodin (including drainage) & d. incorporate flood resilient measures in areas prone to flooding; Where an assessment of flood risk is required, developments should consider surface water flooding in detail and groundwater flooding where applicable
	Drainage Statement	*CHECK SITE DETAILS*	*Yes*			Policy CC3 c. consider the impact of development in areas at risk of flooding
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0002		(including drainage);
	SuDS Proposals	*CHECK SITE DETAILS*	*Yes*	2210419-EWP-ZZ-XX-RP-C-0002		Policy CC3 b. avoid harm to the water environment and improve water qualit
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes			& e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasib
Recommendation (Council to complete)	**Policy compliance**	Required?	Requirement met?	Document title	Page/ section reference	
	Assessments address local, regional & national policies	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 4	*including Local Plan CC3, CPG, new London Plan, National Planning Policy Framework*
	include suitable research & quantification of site flood risks	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	*including Strategic Flood Risk Assessment, Update LFRZ Map & EA Mapping*
	address cumulative impact of developments	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	Policy CC3 c. consider the impact of development in areas at risk of flooding
	propose suitable flood ingress internal coping measures	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;
	propose suitable flood risk mitigation measures	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;
	Internal water consumption target 105 l/p/d (residential)	*Yes*	Residential (TBC by M&E)			Policy CC3 a. incorporate water efficiency measures
	External water consumption target 5 l/p/d (residential)	*Yes*	Residential (TBC by M&E)			Policy CC3 a. incorporate water efficiency measures
	BREEAM Excellent water consumption target (non-resi >500m2	*No*	Residential (TBC by M&E)			Policy CC3 a. incorporate water efficiency measures
	Will not locate vulnerable development in flood-prone area	*Yes*	*No*	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	Policy CC3 f. not locate vulnerable development in flood-prone areas.
	Scheme does not increase flood risk on & off site	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	Policy CC3 The Council will seek to ensure that development does not increase flood risk
	Scheme reduces on&off-site flood risk where possible	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Section 5	Policy CC3 The Council will seek to ensure that development...reduces the risk of flooding where possible
Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Required?	Evidence submitted?	Document title	Page/ section reference	
	Drawings showing site-specific flood risk up to 100yr+40%	*CHECK SITE DETAILS*	No			*allowing 300mm freeboard to potential water ingress points*
	Drawings showing proposed internal coping measures	*CHECK SITE DETAILS*	No			
	Drawings showing proposed flood mitigation measures	*CHECK SITE DETAILS*	No			
	Drawings showing proposed basement/ground floor uses	*CHECK SITE DETAILS*	Yes	2210419-EWP-ZZ-XX-RP-C-0001	Appendix B	
	Building flood risk emergency evacuation plan		No			
	Drawings showing on&off-site overland exceedance flows	*CHECK SITE DETAILS*	No			
	Internal water calculations & proposals (resi	*Yes*	No			Policy CC3 a. incorporate water efficiency measures
	External water calculations & proposals (resi	*Yes*	No			Policy CC3 a. incorporate water efficiency measures
	BREEAM water calculations & proposals (non-resi >500m2	*No*	No			Policy CC3 a. incorporate water efficiency measures

Sustainable Drainage (SuDS) Assessment, Evidence and Proposals

Recommendation (Council to complete)	**Assessments**	Document submitted?	Document title	Page/ section reference	**Guidelines / notes**
	Drainage Statement (DS)	*Yes*	2210419-EWP-ZZ-XX-RP-C-0002		Policy CC3 c. consider the impact of development in areas at risk of flooding (including drainage);
	GLA-Camden SuDS Pro-forma (fully completed)	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Appendix G	Download from www.london.gov.uk/what-we-do/environment/climate-change/surface-

Recommendation (Council to complete)	**Policy compliance**	Requirement met?	Document title	Page/ section reference	
	DS must include identification of flood risk	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 1	
	DS must include assessment of existing, greenfield & proposed runoff rates	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 5 & 7	Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible & Policy CC3 supporting text §8.67
	DS must include identification of measures, in line with the drainage hierarchy, to reduce runoff rates	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	
	Achieve greenfield runoff rates wherever feasible, or as close as possible	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible & Policy CC3 supporting text §8.66
	Constrain runoff volumes to greenfield for 100yr 6hr event where feasible	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	
	Backstop target for unaltered buildings: >50% reduction in existing run-off	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	
	Developments must include SuDS unless inappropriate	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible & Policy CC3 supporting text §8.68
	Development should follow the detailed London Plan drainage hierarchy	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	
	EA climate change factor applied: 2080s upper rainfall intensity allowance (40%)	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7	

Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Evidence submitted?	Document title	Page/ section reference
	Drawings detailing SuDS extent & position (incl. outfalls, control points, levels)	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Appendix H
	Blue-green roof details with area & minimum 150mm substrate for storage	n/a		
	Results of cross-site infiltration rate or similar tests to show soil (in)compatibility	n/a		
	Professional run-off calculations supporting rates & volumes reported in DS	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Appendix F
	Drawings showing on&off-site overland exceedance flows	No		
	Evidence of site surveys and investigations relating to drainage	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Appendix A & C
	Lifetime maintenance and adoption arrangements (and maintenance owner)	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 8
	Management of health & safety risks related to SuDS design	Yes	2210419-EWP-ZZ-XX-RP-C-0002	Section 7
	Confirmation of discharge capacity (or correspondence) from relevant body eg TW	Requested	2210419-EWP-ZZ-XX-RP-C-0002	Section 7