FLOOD RISK ASSESSMENT

Compliant with NPPF 2019 & PPG 2018, new climate change allowances & SUDS guidance & Richmond Policies

Former Public House; change of use to residential

Additional dwellings appropriate in this flood setting
No increase in impermeable areas

- Site in EA Flood Zone 3 defended
- Protected to 1in1000year
- Not within unlikely event of a present day breach flood or rapid inundation zone
- Suitable Evacuation to Flood Zone 1
- Evacuation addressed for a range of flood events
- No increase in impermeable areas
- REDUCE FLOOD RISK OVERALL: flood resilience and resistance to address surface water and extreme fluvial future risk as a precaution
- **Results in better protected and flood future-proofed structure than is existing**

at:

The Old King's Head, Hampton Wick, Hampton Court Road, KT1 4AE

May 2019

ARK Ltd

Table of Contents

1.0 Scope

This report contains the details of a Flood Risk Assessment carried out by Ark Environmental Consultancy Limited ("ARK Ltd") for The Old King's Head, Hampton Wick, Hampton Court Road, KT1 4AE, henceforth referred to as "the site" in this report.

This report has been prepared for Eastmont Holdings Ltd and must not be relied upon by any other party without the explicit written permission of ARK Ltd. All parties to this report do not intend any of the terms of the Contracts (Right of Third Parties Act 1999) to apply to this report.

Please note this report does not purport to provide definitive legal advice nor can it be used to demonstrate that the site will never flood in the future. The Executive Summary contains an overview of key findings and conclusions. However, no reliance should be placed on the Executive Summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the Executive Summary.

2.0 Executive Summary

This FRA has been carried out in accordance with the National Planning Policy Framework (NPPF) & NPPG. It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The proposed development comprises change of use forma Public House to full residential; no increase in impermeable areas; site is located within majority Environment Agency Flood Zone 2.

- Additional dwellings within existing property considered appropriate given LOW hazard flood setting
- Bedrooms and self-contained dwellings at ground level considered appropriate given the flood setting
- Operation with ground floor only dwellings is the same as frequently approved as "change of use to ground floor only flat"
- Evacuation appropriate for lifetime of the scheme: does not go through any higher flood risk areas to reach unrestricted FZ1
- REDUCES FLOOD RISK OVERALL: new modern flood resilience / resistance
- Results in better protected and flood future-proofed structure than is existing

Scheme is categorized as "More Vulnerable" development in FZ2 / potentially far extent of FZ3, in accordance with the NPPF classifications the NPPF Exception Test does need to be passed because of the potential part FZ3. Given the residual risk flood setting, the level, extent and depth of flooding on the site can be managed in terms of resilient measures, the EA fluvial Flood warning and easy and safe evacuation to areas in Flood Zone 1 for the lifetime of the development. This FRA considers the Exception Test can be passed.

Compliant with Richmond Policies: site can operate safely in the unlikely event of a flood reaching the site & scheme addresses residual risk of flooding, as per NPPF / PPG & local policy.

Based on the likely flooding risk and small scale of the proposed development, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere; it is therefore considered appropriate development in accordance with the NPPF/PPG.

3.0 Introduction

The FRA combined a desktop study, review of available information, consultations and an assessment of all sources of flooding posed to and from the site and proposed development, in accordance with National Planning Policy Framework (NPPF) & PPG. Appropriate flood mitigation measures were then considered, either as already incorporated within the scheme or recommended for inclusion at detailed design stage. The suitability of the proposed development was also reviewed in the context of the NPPF and the technical guidance accompanying the NPPF.

4.0 Purpose of the Report

This FRA has been carried out in accordance with National Planning Policy Framework (NPPF). It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The report provides the following information:

- An assessment of the flood risk posed to the site based on flood information and mapping provide by the EA and Strategic Flood Risk Assessment (SFRA);
- An assessment of the proposed development in terms of surface water run-off; and
- Proposals for measures to mitigate the flood risks posed to and from the development where appropriate.

5.0 Report Information Sources

The information source used to undertake this FRA has been collected from the following sources:

- British Geological Survey Website & iGeology App
- EA Website & Data
- London Borough of Richmond upon Thames (LBRuT)Strategic Flood Risk Assessment (2016 as updated);
- DRAIN LONDON Preliminary (Surface Water) Flood Risk Assessment for London Borough of Richmond LBRuT (GLA & Environment Agency, June 2011)
- London Plan SUDS Guidance as applicable
- Internet mapping and searches.

6.0 Consultation

The EA have been consulted; the report follows the recommendations of previously approved similar reports for Richmond.

7.0 Overview of British Legislation

7.1 National Planning Policy

Note: where this report references NPPF 2019, this also covers PPG 2018.

The National Planning Policy Framework (NPPF) and PPG supercede all Planning Policy Statements (PPS's) and remaining Planning Policy Guidance (PPG's). Flood risk is retained as a key development consideration and is incorporated within Section 10: "Meeting the challenge of climate change, flooding and coastal change":

> "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

The Sequential and Exception Tests are retained as part of the NPPF. The accompanying NPPF Technical Guidance also includes Tables 2 and 3 to assist with flood risk vulnerability classifications and development suitability.

Government SUDS Guidance and new Climate Change allowances compliant.

7.2 Local Policy

Local Authorities (as amended) consider flood risk through relevant environmental and climate change policies which enforce the requirements of the NPPF and PPG.

The Strategic Flood Risk Assessment (SFRA) and Preliminary Flood Risk Assessment (PFRA) are key sources of flood risk specific information for the area. These provides a more detailed review of flood risks and recommendations for ensuring developments can be constructed and operated safely in accordance with the NPPF. Greater detail is provided in the report where appropriate.

Key policies in Richmond:

- SFRA
    - FRA to demonstrate no risks posed to or from the scheme (NPPF compliance)
    - Appropriate evacuation in different flood scenarios (standard EA requirement)
    - Promoting drainage devices to minimize sewer flooding to properties (standard building regulations / technique) most usually associated with full new builds

8.0 Site Status and Environmental Setting

8.1 Site Location and Status

The site is c. 0.01 hectares and located at the junction of Hampton Court Road and Home Park Terrace. The River Thames is c. 135m to the east of the site. See Appendix A for Location & Existing Floor Plans.

8.2 Current Site Description

The following description is based on information made available from internet mapping and aerial photography.

The site is currently occupied by a former Public House.

8.3 Existing Flood Risk

Flood Sources	Site Status	Comment on flood risk posed to / from the development
Fluvial / Tidal	Site is in majority Flood Zone FZ2 defended / partly in or adjacent to furthest extent of FZ3 Not in EA breach flood extent til 2100 NPPF: High Annual Probability but defended	Scheme is to change the Pubic House use to full residential Access / egress in LOW hazard in breach even til 2100 – appropriate scheme No increase in impermeable areas All evacuation to areas above extreme event for the lifetime of the scheme
Groundwater	SFRA mapping indicates site not in area of groundwater flooding.	The proposed development will not increase the risk of groundwater flooding Low Risk
Artificial Sources	No artificial sources within 250m	Low Risk
Surface Water / Sewer Flooding	Site is located within a surface water risk zone ACCESS & EGRESS IS IN NO - LOW HAZARD Condition, depth and location of surrounding infrastructure uncertain	No increase in impermeable areas. New modern flood resilience / resistance Development will utilise existing connection to sewers, gravity drainage and non-return valves Development will not increase the peak flow or volume of discharge from the site: Low Risk: No further drainage assessment required as part of the FRA
Climate Change & new allowances	Included in the flood modelling extents Site not within climate change flood extent area	Development will not significantly increase the peak flow and volume of discharge from the site Low risk posed to and from the development

Site is in majority Flood Zone 2 / partly in or adjacent to furthest extent of FZ3.

The site is still at potential residual risk from extreme event overtopping but not unlikely event of a breach in this location.

Given the residual fluvial flood risk, the assessment concentrates on the hazard rating, design response and flood response management including suitability of evacuation.

In the critical lower probability flood events, flood waters are not likely to reach the site, regardless, evacuation would be feasible and the preferred option.

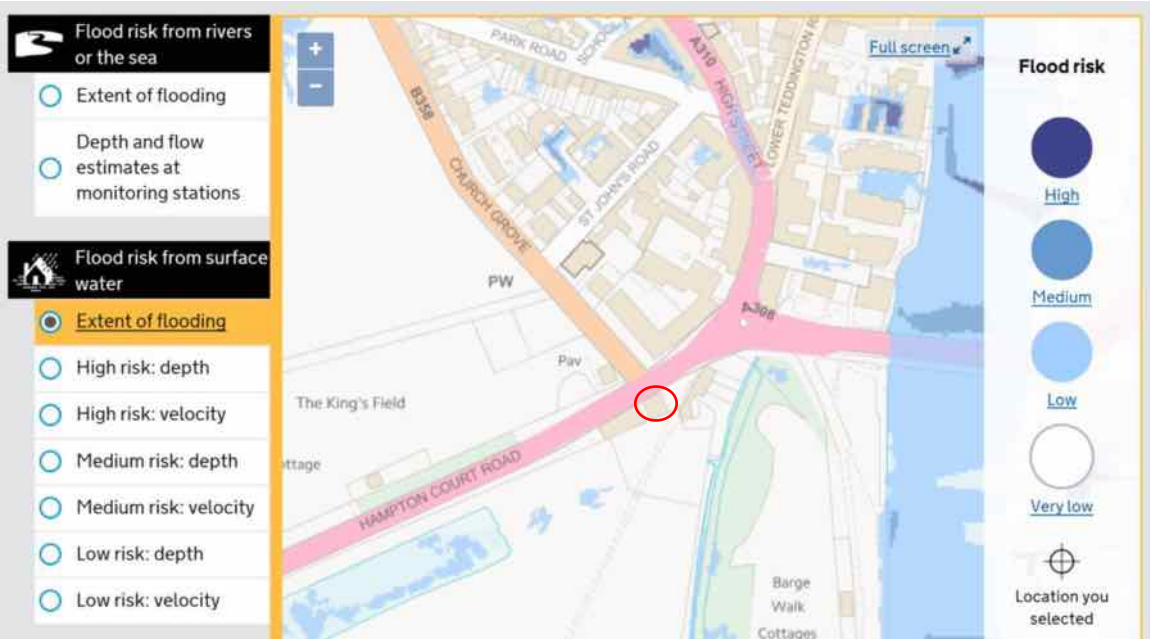
The site is within the EA Flood Warning area.

- Site is not in rapid inundation zone

The Richmond updated SFRA does not indicate any other sources of flooding posed to the site.

8.4 EA 2019 Surface Water Hazard

- Critical: Site and access & egress remain in NO hazard and likely flood free in all EA scenarios
- Refer to mapping extract below:



8.5 DESIGN RESPONSE

Raised ground floor levels are not considered necessary given:

a) the LOW hazard
b) the NO - LOW hazard in EA surface water risk scenarios
c) the change of use scheme which means a raised ground floor is not necessarily feasible but neither is it necessary

However: the correct approach is:

1. Robust flood resilience for the whole of the ground floor in order to flood future proof the property
2. Robust flood resistance: if feasible given planning constraints on this type of building: floodgates at 600mm height (maximum height advisable)

9.0 Assessment of Proposed Development

9.1 Proposed Development

The proposed development comprises:

- Change public house to residential dwellings
- Given flood setting as per EA data:
    - Site is appropriate for ground floor self-contained dwellings
    - Bedrooms on ground floor are appropriate

REDUCES FLOOD RISK OVERALL:

- New flood resilient measures
- London Plan compliant

Not within the breach flood extents or rapid inundation zone: compliant with council and EA policy / guidance

- No increase in impermeable areas
- REDUCE FLOOD RISK OVERALL: Resilient and resistant measures (see later sections) i.e. waterproofing to industry standards
- No formal SUDs required given scheme, no increase in impermeable areas and change of use within existing footprint
- Non-return valves where new drainage required

Given the flood hazard setting and existing building: raised floor levels are not considered necessary.

Fluvial / Surface Water

- Precautionary only (not necessary):
    - Not required but: 600mm flood gates on entrance where feasible would be a sensible approach to address residual surface water hazard for this scheme

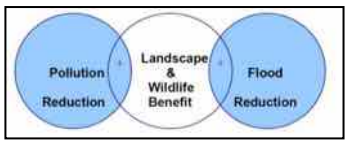
Drainage

- The existing connections will be retained.
    - Non-return valves on all new units / connections

9.1b SUDS Hierarchy Check

Concept SUDS Strategy

The following diagram indicates the philosophy behind the proposed SUDS strategy, and is taken from the EA's SUDS guidance:



(Source: Environment Agency, 2009)

The Table below indicates the SUDS Hierarchy Appraisal for the site and proposed development:

Site Specific SUDS Appraisal

SUDS Hierarchy	SUDS Technique	Potential Benefits			Site Specific	
		Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit	?	Scheme Specific SUDS Suitability Appraisal and Comment
Most Sustainable	Living Roofs	•	•	•	X	Not likely feasible given nature of existing structure & roof construction. (Blue, Green and Brown roofs)
	Ponds / Basins	•	•	•	X	Not likely suitable given site constraints and scheme is change of use confined to existing footprint and impermeable areas. No increase in impermeable areas
	Swales	•	•	•	X	Not likely suitable given site constraints and scheme is change of use confined to existing footprint and impermeable areas. No increase in impermeable areas
	Infiltration Techniques	•	•		X	Not likely suitable given site constraints and scheme is change of use confined to existing footprint and impermeable areas. No increase in impermeable areas
Least Sustainable	Permeable Surfaces / underground storage	•	•		X	Not likely suitable given site constraints and scheme is change of use confined to existing footprint and impermeable areas. No increase in impermeable areas
	Tanked Systems	•			X	Not likely suitable given site constraints and scheme is change of use confined to existing footprint and impermeable areas. No increase in impermeable areas

Key:
Potentially suitable at the site: * Incorporated in the scheme: ✓ Not suitable / possible at the site: X

9.2 Flood Resilience

The proposed development will utilize the flood resilient techniques recommended in the NPPF Technical Guidance where appropriate and also the recommendations that have previously been issued by various councils.

As per previous correspondence with Richmond planning officers and as agreed:

The FRA provides the recommended resilient measures that can be incorporated; because the scheme is a change of use within the curtilage of the existing footprint, it will depend on the construction team as to what construction will actually need to be undertaken and tied in to the existing structures.

The ground floor as standard will have all new flood resistant and resilient standards.

This does not invalidate the points and recommendations of this FRA. The FRA cannot simply specify the exact measures that need to be changed or the exact specifications of products to be used, especially as technology changes rapidly; they are not required of planning.

BUT:

If any of these elements are required to be newly installed for the change of use at ground level as part of the scheme they will be constructed following the resilience guidance as is mandatory:

In addition to the standard flood resilient measures:

The following are to be applied / used:

- Non-return valves as standard for ground floor connections
- Waterproofing to be installed above ground level as appropriate
- Plasterboards will be installed in horizontal sheets rather than conventional vertical installation methods to minimise the amount of plasterboard that could be damaged in a flood event
- Wall sockets will be raised to as high as is feasible and practicable in order to minimise damage if flood waters inundate the property
- Any wood fixings will be robust and/or protected by suitable coatings in order to minimise damage during a flood event
- Airbricks will be raised to as high as is feasible and practicable
- The Damp Proof Membrane and ground waterproofing will be installed above the main ground floor slab (as existing or new if required) and tied in to the walls where appropriate, to reduce the turnaround time for returning the property to full operation after a flood event.

9.3 Refuge and Evacuation

Based on the likely flood risk (EA / SFRA data) and associated warning time that is feasible and the low residual risk, it is considered likely that there would be sufficient time to evacuate in normal flood warning situations from all types of flood events.

The site is not within the flood extent in the unlikely event of a present day breach in the defences, hence this fastest type of flooding does not need to be considered.

However a precautionary approach has been taken in the following evacuation response management.

Early Fluvial Flood Warning – Evacuation

If upon EA early warning of a potential overtopping is provided, the preferred evacuation route should be:

Note: site already outside of present day breach extent

- West on Hampton Court Road; already within LOW hazard FZ2
- Continue to unrestricted FZ1

Alternative

- Cross Hampton Court Road into unrestricted FZ1 and go north on Church Grove

This route does go through similar and lower residual hazard areas as identified in the EA data / SFRA and not through any higher flood risk areas. This is appropriate.

There is no need for any occupant to have to walk through flood waters given advanced warning for the principal Thames flood source.

Given meteorological warning (number of days), distance of site from flood source, the scheme can operate safely.

9.4 Annual Monitoring

It is recommended that future site users should contact the EA on an annual basis to confirm the flood status of the property.

If the flood status has changed, the evacuation and refuge plan should be reviewed and updated by suitable flood risk consultants as appropriate.

9.5 Flood Response Management

It is recommended that the future users understand and sign up to the EA Flood Warning scheme.

Precautionary evacuation is always the preferred approach.

Flood Safety Pack

Occupants should ensure a flood safety evacuation pack is kept in a safe and easily accessible place. This should include as a minimum:

- First aid kit
- Torch
- Warm clothing or blanket
- List of appropriate contact numbers
- Bottled water
- Waterproofs / Wellington boots

- Non-perishable food

9.6 Surface Water Runoff – Flood Risk from the Development

In accordance with the NPPF, this FRA also considers the risks posed from the development to surrounding areas.

Scheme is change of use and no increase in impermeable areas.

Given there will be no increase in impermeable areas it is considered there will be no significant increase in discharge from the site; the proposed development will also continue to use existing / have new connections to the existing sewers.

The proposals will incorporate new low-water demand devices where necessary and such that there will not be an increase in peak flows or volume of flows.

Given the small scale of the proposed development it is considered likely that the development will have no impact on surrounding infrastructure. There will not be any significant increase in overland flow from the site.

9.7 Climate Change: including new allowances

The impact of climate change in accordance with the NPPF is likely to be an increase in the rainfall intensity in the future, which will increase peak storm flows to sewer. The proposed development will incorporate low flush and reduced water demand showers and toilets, such that the combined flows to sewer are likely to have a negligible impact. It is considered therefore that flows in the future are not likely to have a significant impact, even with an allowance for climate change.

The site is in FZ2 / partly furthest extent of FZ3 attributed to the heavily managed Thames: this flood mapping it is considered appropriate to accommodate for the extreme levels with additional climate change incorporated.

There is unlikely to be an impact on the receiving sewers owing to the small scale of the development with no increase in impermeable areas.

9.8 Flood Risk Vulnerability

According to the NPPF/PPG retained Flood Risk Vulnerability Classification, the change to residential would be classified as “More Vulnerable.”

The NPPF also retained Flood Risk Vulnerability and Flood Zone “Compatibility” Classification; this states that a “More Vulnerable” development in Flood Zone 3 is appropriate if the Exception Test can be passed.

9.9 Exception Test

Table 2 provides the likely response to the 2 key criteria of the Exception Test, which should be confirmed by the planning department. This FRA provides the second element required of NPPF to satisfy the Exception Test.

Table 2: Exception Test Summary

Exception Test Criteria	Proposed Development
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared.	Planners to confirm. The scheme will not increase impermeable areas. **Ground floor only dwellings are appropriate in this flood setting as not in rapid inundation zone and not in breach and in FZ2** **Appropriate mitigation is flood resilient and resistant measures**
A FRA must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall.	Pass. Suitable evacuation timing and route for fluvial and surface water. Site in majority FZ2 Same in principle as “change of use to ground floor only flat” • Not within present day breach extents • Safe, NO - LOW hazard • Access / Egress is appropriate • Operation with ground floor as lowest access / egress remains the same • REDUCES FLOOD RISK OVERALL: new modern flood resilience / resistance • Results in better protected and flood future-proofed structure than is existing As long as the flood resilient measures are incorporated, and the future occupiers sign up to the EA flood warning and understand the flood response required, it is considered likely that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF.

Based on the data reviewed to date, the flood risk assessment recommends the property could be constructed and operated safely in flood risk terms without increasing flood risk elsewhere.

10.0 Conclusion

The site is considered to be generally at a low risk from all sources of flooding except the potential future extreme overtopping event / residual surface water hazard.

The proposed development is categorised as “Highly & More Vulnerable” in accordance with the NPPF; it is therefore an appropriate type of development within Flood Zone 2 / part edge of FZ3, as appropriate, if the Exception Test can be passed.

- Not within breach extents
- Safe, NO - LOW hazard
- Operation with ground floor only dwelling is the same as frequently approved "change of use to ground floor only flat" in FZ2

- Evacuation appropriate for lifetime of the scheme: does not go through any higher flood risk areas to reach unrestricted FZ1
- REDUCES FLOOD RISK OVERALL: new modern flood resilience / resistance
- **Results in better protected and flood future-proofed structure than is existing**

The proposed scheme can incorporate suitable flood resilient measures and safe evacuation is feasible.

Based on the likely flooding risk, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF.

11.0 Appendices

A. Location and Existing Layout
B. Proposed Layout and Floor Plans

Appendices A & B