BASEENERGY
Building Assessments for a Sustainable Environment

North
t: 0151 933 0328
m: info@baseenergy.co.uk
44 Canal Street
Bootle
Liverpool
L20 8QU

South
t: 020 3286 2016
m: info@baseenergy.co.uk
117 Knyvett House,
Watermans Business
Park, The Causeway,
Staines-upon-Thames,
TW18 3BA

Flood Risk Assessment Rev2

Site Address:

319 and 319A Richmond Road
Twickenham
TW1 2PB

Date:

20 December 2024

Appendices

Appendix A - Existing and Proposed Site Plans
Appendix B - Existing Floor Plans
Appendix C - Proposed Floor Plans

Prepared by	Checked by	Date
Carina Hassall BSc (Hons)	Peter Kinsella BSc (Hons)	20 December 2024

This document has been prepared solely as a Flood Risk and Surface Water Report for Lara James. Base Energy accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

1. Introduction

This Flood Risk Assessment (FRA) has been prepared to support a planning application at 319 and 319A Richmond Road, Twickenham, TW1 2PB

Development Proposals

Proposals are for the conversion of two flats into a single-family dwelling, including remedial work.

A copy of the existing and proposed site plans is provided in **Appendix A**.

The existing floor plans are provided in **Appendix B**, and the proposed floor plans are provided in **Appendix C**.

2. Planning Policy- Flood Risk, and Surface Water Management

National Planning Policy Framework

The aim of the National Planning Policy Framework (NPPF) (and accompanying Planning Practice Guidance (PPG)) is to direct development away from areas at highest risk of flooding; where development is necessary, it should be made safe without increasing flood risk elsewhere.

The NPPF states that a Flood Risk Assessment (FRA) is required to support a planning application for developments that are:

- located in Flood Zone 2 and/or Flood Zone 3
- located in Flood Zone 1 and comprise 1ha or above

In some instances, for example where a site is located in Flood Zone 1 and comprises less than 1ha, an FRA may be required if the site is within an area which has critical drainage problems (i.e. a Critical Drainage Area - CDA) as notified to the Local Authority by the Environment Agency (EA).

In order to provide an indication of the flood zone classification of the site, and to ascertain whether an FRA is required, the starting point is the EA flood maps which are available on the EA website.

Environment Agency Flood Map

The EA flood maps show fluvial and tidal flood outlines based on the following:

- Flood Zone 1 - land assessed as having less than 1 in 1000 annual probability of river or sea flooding
- Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding, or between a 1 in 200 and 1 in 1000 annual probability of flooding from the sea
- Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding, or a 1 in 200 or greater annual probability of flooding from the sea

The flood maps available on the EA website confirm that the site is located in Flood Zone 1 (**Figure 1**).

Given that the site is located in Flood Zone 1, and comprises less than 1ha, an FRA would not generally be required, unless the site is located within a CDA.

Critical Drainage Area

Reference has been made to the London Borough of Richmond 'Critical Drainage Area' (CDA) maps within the Surface Water Management Plan (SWMP); the site is shown to be in a CDA and on this basis an FRA is required to support the planning application.

An assessment of all potential sources of flood risk is provided in the following section.

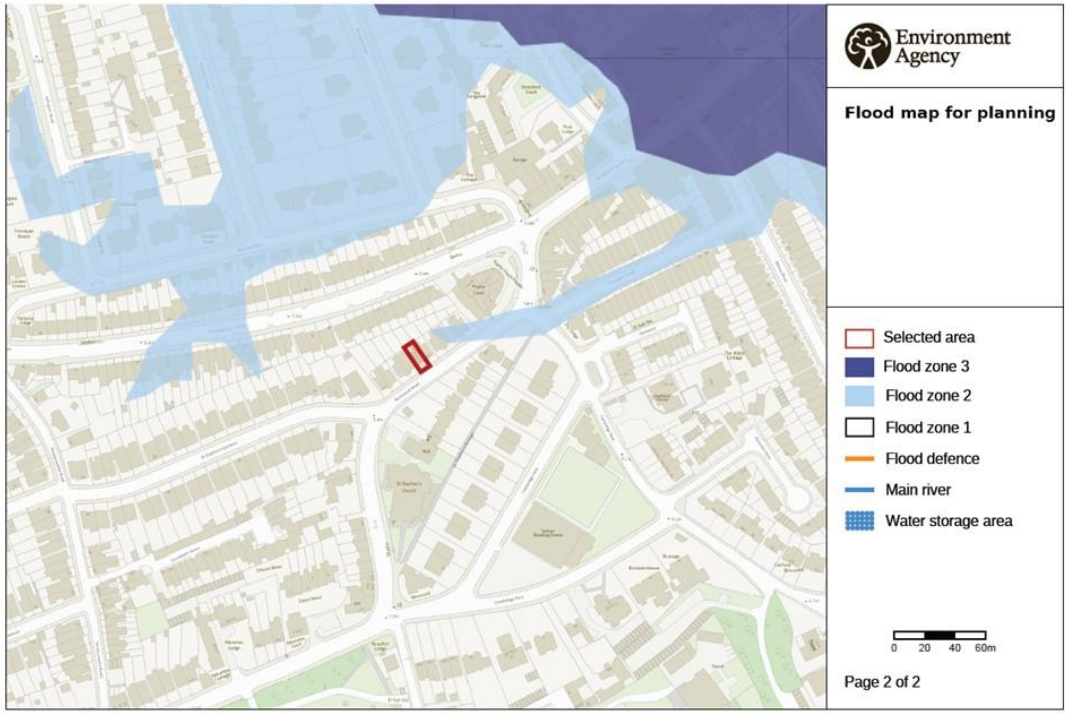


Figure 1 - Environment Agency Flood Map

The London Plan 2021

Policy SI 12 Flood risk management

A Current and expected flood risk from all sources across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.

B Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.

C Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.

D Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.

E Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood

F Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Unless exceptional circumstances are demonstrated for not doing so, development proposals should be set back from flood defences to allow for any foreseeable future maintenance and upgrades in a sustainable and cost-effective way.

G Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat

Policy SI 13 Sustainable drainage:

A Lead Local Flood Authorities should identify – through their Local Flood Risk Management Strategies and Surface Water Management Plans – areas where there are particular surface water management issues and aim to reduce these risks. Increases in surface water run-off outside these areas also need to be identified and addressed.

B Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:

1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2) rainwater infiltration to ground at or close to source
3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4) rainwater discharge direct to a watercourse (unless not appropriate)
5) controlled rainwater discharge to a surface water sewer or drain
6) controlled rainwater discharge to a combined sewer.

C Development proposals for impermeable surfacing should normally be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.

D Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

9.13.1 London is at particular risk from surface water flooding, mainly due to the large extent of impermeable surfaces. Lead Local Flood Authorities have responsibility for managing surface water drainage through the planning system, as well as ensuring that appropriate maintenance arrangements are put in place. Local Flood Risk Management Strategies and Surface Water Management Plans should ensure they address flooding from multiple sources including surface water, groundwater and small watercourses that occurs as a result of heavy rainfall.

9.13.2 Development proposals should aim to get as close to greenfield run-off rates as possible depending on site conditions. The well-established drainage hierarchy set out in this policy helps to reduce the rate and volume of surface water run-off**. Rainwater should be managed as close to the top of the hierarchy as possible. There should be a preference for green over grey features, and drainage by gravity over pumped systems**. A blue roof is an attenuation tank at roof or podium level; the combination of a blue and green roof is particularly beneficial, as the attenuated water is used to irrigate the green roof.

9.13.3 For many sites, **it may be appropriate to use more than one form of drainage**, for example a proportion of rainwater can be managed by more sustainable methods, with residual rainwater managed lower down the hierarchy. In some cases, direct discharge into the watercourse is an appropriate approach, for example rainwater discharge into the tidal Thames or a dock. This should include suitable pollution prevention filtering measures, ideally by using soft engineering or green infrastructure.

In addition, if direct discharge is to a watercourse where the outfall is likely to be affected by tide-locking, suitable storage should be designed into the system. However, in other cases direct discharge will not be appropriate, for example discharge into a small stream at the headwaters of a catchment, which may cause flooding. This will need to be assessed on a case-by-case basis, taking into account the location, scale and quality of the discharge and the receiving watercourse. The maintenance of identified drainage measures should also be considered in development proposals.

9.13.4 The London Sustainable Drainage Action Plan complements this policy. It contains a series of actions to make the drainage system work in a more natural way with a particular emphasis on retrofitting.

London Borough of Richmond Local Plan

Policy LP 21 Flood Risk and Sustainable Drainage

A. All developments should avoid, or minimise, contributing to all sources of flooding, including fluvial, tidal, surface water, groundwater and flooding from sewers, taking account of climate change and without increasing flood risk elsewhere. Development will be guided to areas of lower risk by applying the 'Sequential Test' as set out in national policy guidance, and where necessary, the 'Exception Test' will be applied. Unacceptable developments and land uses will be refused in line with national policy and guidance, the Council's Strategic Flood Risk Assessment (SFRA).

In Flood Zones 2 and 3, all proposals on sites of 10 dwellings or more or 1000sqm of non-residential development or more, or on any other proposal where safe access/egress cannot be achieved, a Flood Emergency Plan must be submitted.

Where a Flood Risk Assessment is required, on-site attenuation to alleviate fluvial and/or surface water flooding over and above the Environment Agency's floodplain compensation is required where feasible.

B. Basements within flood affected areas of the borough represent a particularly high risk to life, as they may be subject to very rapid inundation.

C. The Council will require the use of Sustainable Drainage Systems (SuDS) in all development proposals. Applicants will have to demonstrate that their proposal complies with the following:
1. A reduction in surface water discharge to greenfield run-off rates wherever feasible.
2. Where greenfield run-off rates are not feasible, this will need to be demonstrated by the applicant, and in such instances, the minimum requirement is to achieve at least a 50% attenuation of the site's surface water runoff at peak times based on the levels existing prior to the development.

D. Applicants will have to demonstrate that their proposal complies with the following:
1. Retain the effectiveness, stability and integrity of flood defences, river banks and other formal and informal flood defence infrastructure.
2. Ensure the proposal does not prevent essential maintenance and upgrading to be carried out in the future.
3. Set back developments from river banks and existing flood defence infrastructure where possible (16 metres for the tidal Thames and 8 metres for other rivers).

4. Take into account the requirements of the Thames Estuary 2100 Plan and the River Thames Scheme, and demonstrate how the current and future requirements for flood defences have been incorporated into the development. 5. The removal of formal or informal flood defences is not acceptable unless this is part of an agreed flood risk management strategy by the Environment Agency.

3. Sources of Flood Risk

Fluvial / Tidal Flood Risk

The site is shown to be located within Flood Zone 1 and is therefore considered to be at low risk of fluvial / tidal flooding.

Critical Drainage Area

The London Borough of Richmond Surface Water Management Plan (SWMP) defines a CDA as: '*a discrete geographic area (usually within an urban setting) where there may be multiple and interlinked sources of flood risk and where severe weather is known to cause flooding of the area thereby affecting people, property or local infrastructure*'.

As previously detailed, the site is located in a designated CDA.

Measures are outlined in the following section to mitigate the risks of the site being in a CDA.

Surface Water Flooding

Surface water flooding results from rainfall generated overland flows, before the runoff reaches a watercourse/ drainage system, or where the watercourse/ drainage system is overwhelmed and unable to accept further runoff. Surface water runoff is usually associated with high intensity rainfall events but may also occur with lower intensity rainfall where the ground is saturated, developed or otherwise has low permeability resulting in overland flows and ponding within depressions in the topography.

The EA provide maps on their website which illustrate the risk of surface water flooding along with potential depths and velocities (see **Figure 2**); these show that the site is located in an area where there is a high risk of surface water flooding, with potential maximum depths of up to 300mm.

Measures are outlined in the following section to mitigate the risks of the site being in an area where there is a high risk of surface water flooding.

Groundwater Flooding

Groundwater flooding generally occurs during intense, long-duration rainfall events, when infiltration of rainwater into the ground raises the level of the water table until it exceeds ground levels. It is most common in low-lying areas overlain by permeable soils and permeable geology, or in areas with a naturally high water table.

Reference has been made to the British Geological Survey geology maps; these indicate that the site is underlain by Kempton Park Gravel Member - Sand and gravel. The underlying bedrock is London Clay.

As noted, the basement is already in situ and therefore should not impact on groundwater regimes at the site. Additionally, given the presence of clay, the risk of groundwater flooding is considered low.

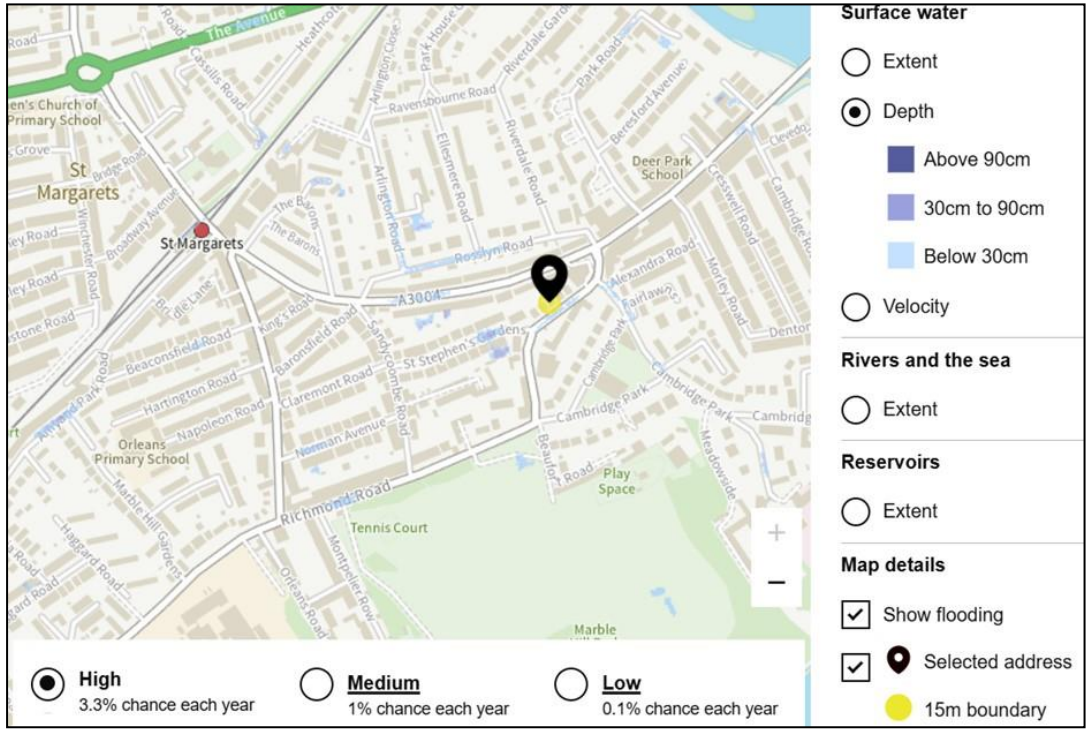


Figure 2 - Environment Agency Surface Water Flooding Map

Sewer Flooding

Sewer flooding occurs when the capacity of underground sewerage systems is exceeded, resulting in flooding inside and outside of buildings. Normal discharge of sewers and drains through outfalls may be impeded by high water levels in receiving waters.

There are no known records of surface water flooding at the site location.

4. Flood Mitigation

As detailed in the previous section, the main risk of flooding at the site location is from surface water.

However, the proposals afford the opportunity for mitigation measures to be incorporated which will ensure that flood risk is not exacerbated at the site and surrounding areas.

Sleeping Accommodation

As part of the proposals all sleeping accommodation will be relocated to the upper floors.

Flood Resilient Measures

Wherever feasible, flood resilient measures will be included into the basement and ground floor levels in line with guidance provided in the Communities and Local Government Document, *Improving the Flood Performance of New Buildings: Flood Resilient Construction'*[1]. These could include:

- Where possible, all service entries will be sealed (e.g. with expanding foam or similar closed cell material).
- Pipework: Closed cell insulation
- Non-return valves in the drainage system to prevent back-flow.
- Water, electricity and gas meters raised
- Electrical sockets raised

Surface Water and SuDS

The proposals afford the opportunity for SuDS to be incorporated which will provide a level of betterment (in terms of surface water management) when compared with the existing situation. The type of SuDS could include a water butt for simple rainwater recycling, or a rain planter.

[1] Improving the Flood Performance of New Buildings: Flood Resilient Construction. Department for Communities and Local Government. May 2007.

5. Conclusions

This Flood Risk Assessment (FRA) has been prepared to support a planning application at 319 and 319A Richmond Road, Twickenham, TW1 2PB

Proposals are for the conversion of two flats into a single-family dwelling, including remedial work.

Flood Risk

The site is shown to be located within Flood Zone 1 and is therefore considered to be at low risk of fluvial / tidal flooding.

The site is located in a designated CDA

The EA surface water flooding maps show that the site is located in an area where there is a high risk of surface water flooding, with potential maximum depths of up to 300mm.

The British Geological Survey geology maps indicate that the site is underlain by Kempton Park Gravel Member - Sand and gravel. The underlying bedrock is London Clay.

As noted, the basement is already in situ and therefore should not impact on groundwater regimes at the site. Additionally, given the presence of clay, the risk of groundwater flooding is considered low.

There are no known records of surface water flooding at the site location.

Flood Risk Mitigation

As detailed, the main risk of flooding at the site location is from surface water.

However, the proposals afford the opportunity for mitigation measures to be incorporated which will ensure that flood risk is not exacerbated at the site and surrounding areas.

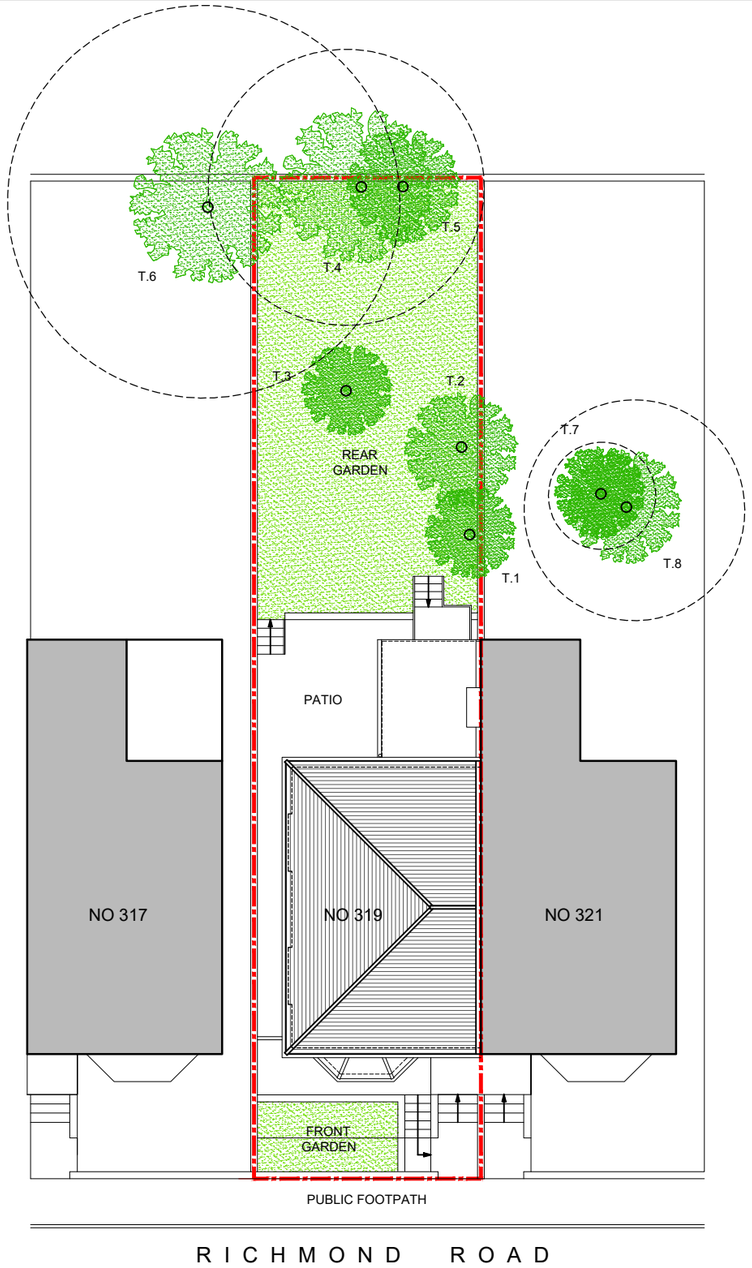
As part of the proposals all sleeping accommodation will be relocated to the upper floors.

Wherever feasible, flood resilient measures will be included into the basement and ground floor levels in line with best practice guidance.

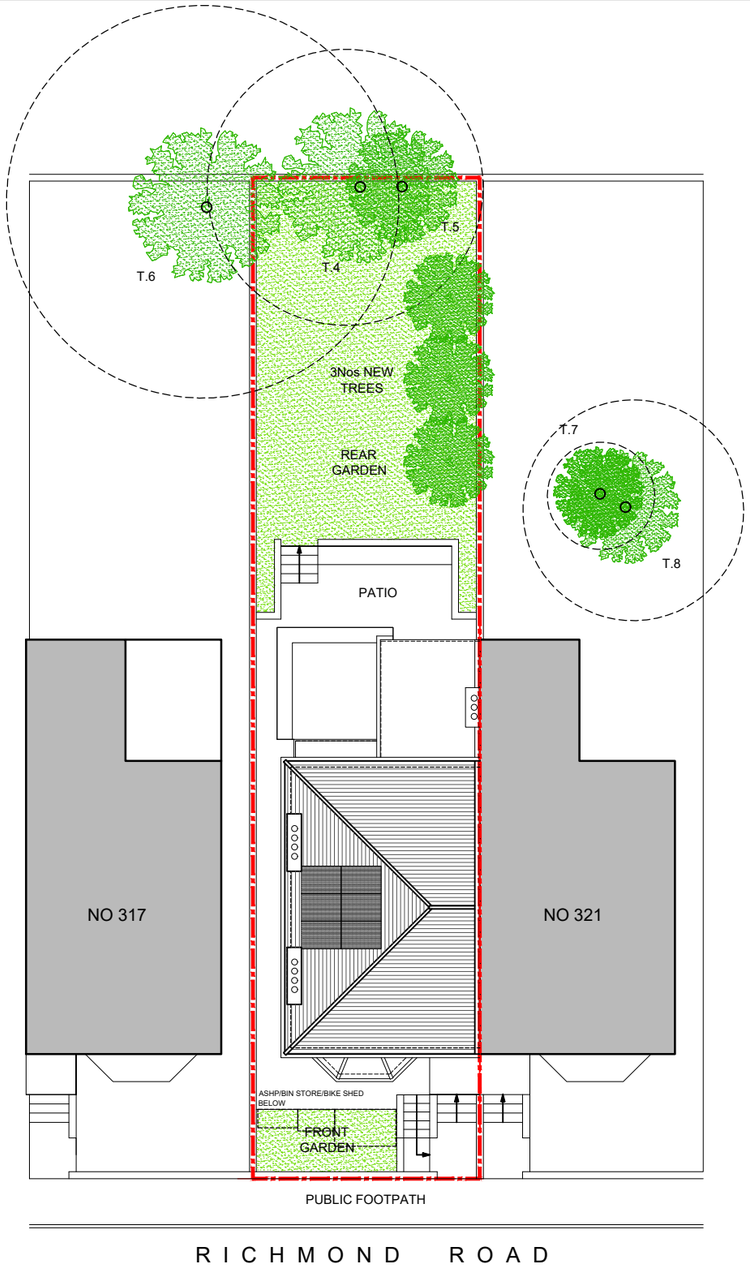
The proposals afford the opportunity for SuDS to be incorporated which will provide a level of betterment (in terms of surface water management) when compared with the existing situation. The type of SuDS could include a water butt for simple rainwater recycling, or a rain planter.

Appendices

Appendix A - Existing and Proposed Site Plans



EXISTING BLOCK PLAN



PROPOSED BLOCK PLAN

REV DATE DESCRIPTION

A R C H I T E C T U R E
HANNA KURNEL E: HANNAK@HOTMAIL.CO.UK M: 07795840020

PROJECT
PROPOSED CONVERSION FROM FLATS TO SINGLE HOUSE,
SINGLE STOREY REAR EXTENSION, WINDOW REPLACEMENT
AND SUNDRY ALTERATIONS
319 & 319A RICHMOND ROAD
TW1 2PB TWICKENHAM

DRAWING TITLE
EXISTING AND PROPOSED
BLOCK PLANS

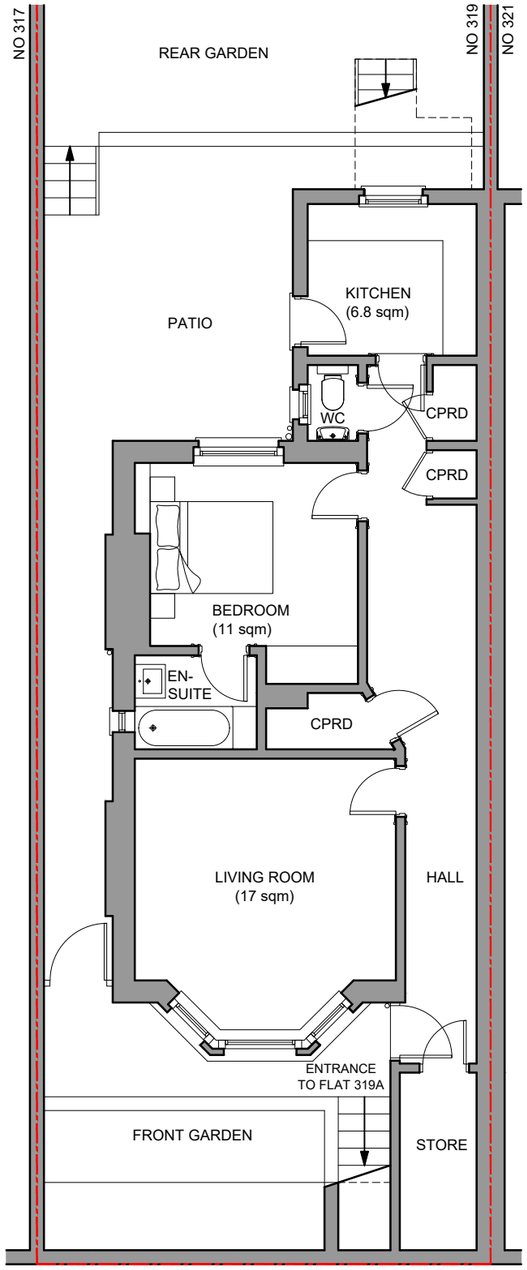
DRAWING No	SCALE	DATE
(PL)01	1:200@A3	NOV'24

N

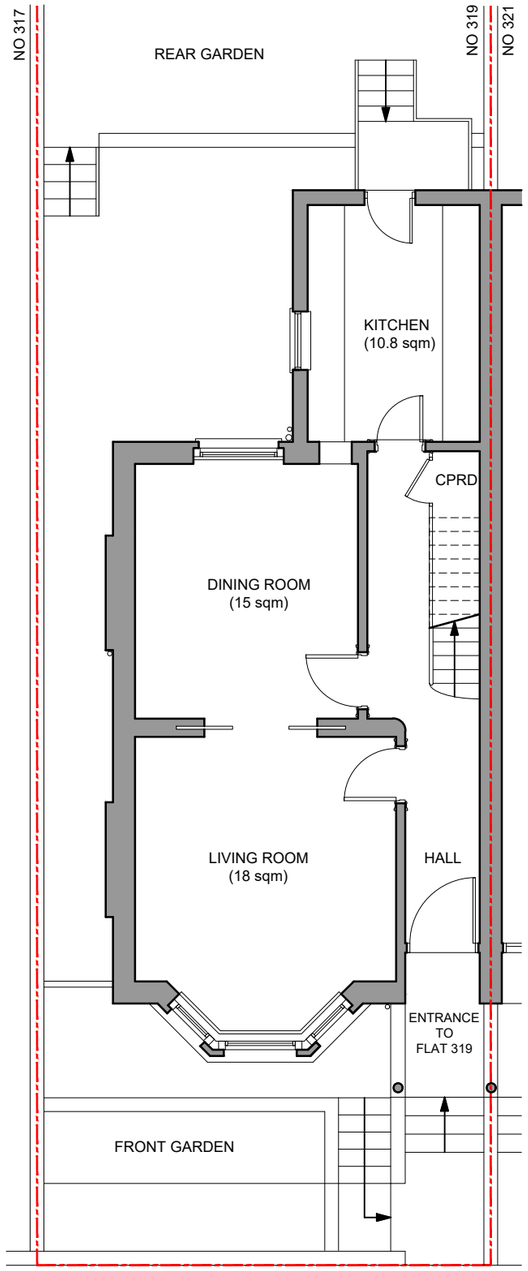
0 10m 20m

NOTES

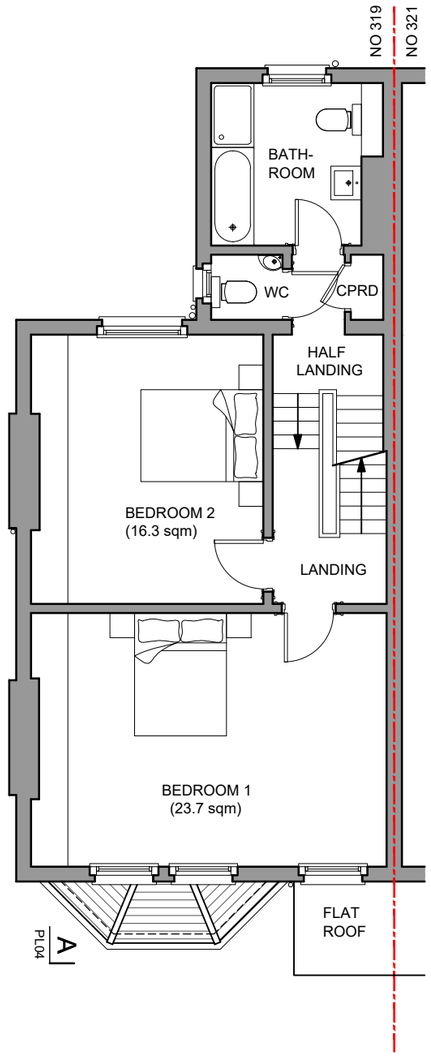
Appendix B - Existing Floor Plans



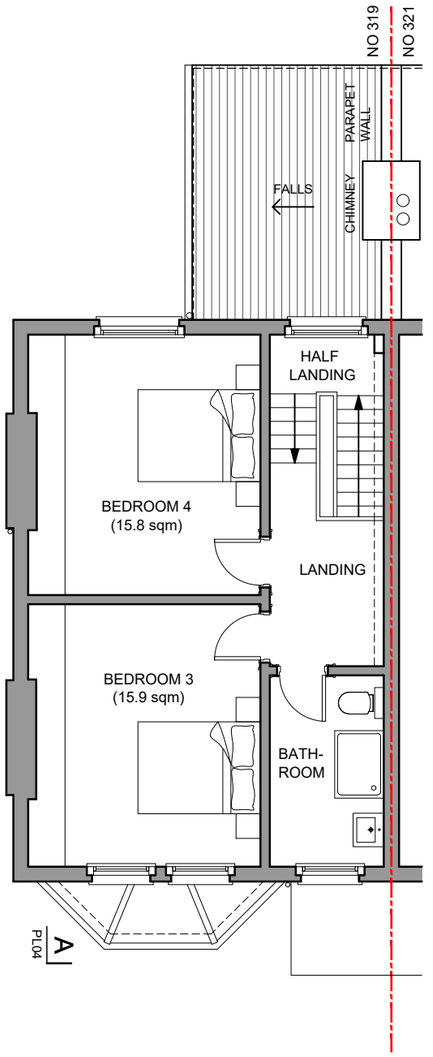
EXISTING LOWER GROUND FLOOR



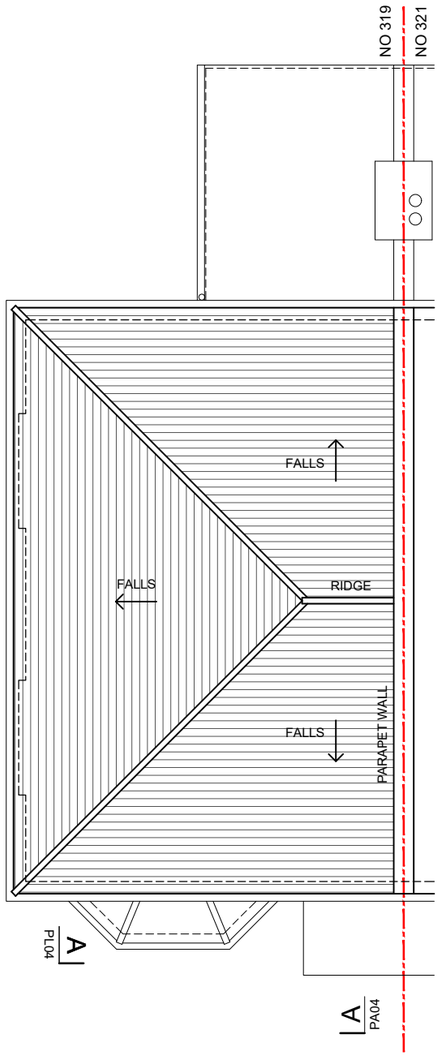
EXISTING UPPER GROUND FLOOR



EXISTING FIRST FLOOR



EXISTING SECOND FLOOR



EXISTING ROOF PLAN

REV DATE DESCRIPTION

ARCHITECTURE
HANNA KURNEL E: HANNAK@HOTMAIL.CO.UK M: 07795840020

PROJECT
PROPOSED CONVERSION FROM FLATS TO SINGLE HOUSE, SINGLE STOREY REAR EXTENSION, WINDOW REPLACEMENT AND SUNDRY ALTERATIONS
319 & 319A RICHMOND ROAD
TW1 2PB TWICKENHAM

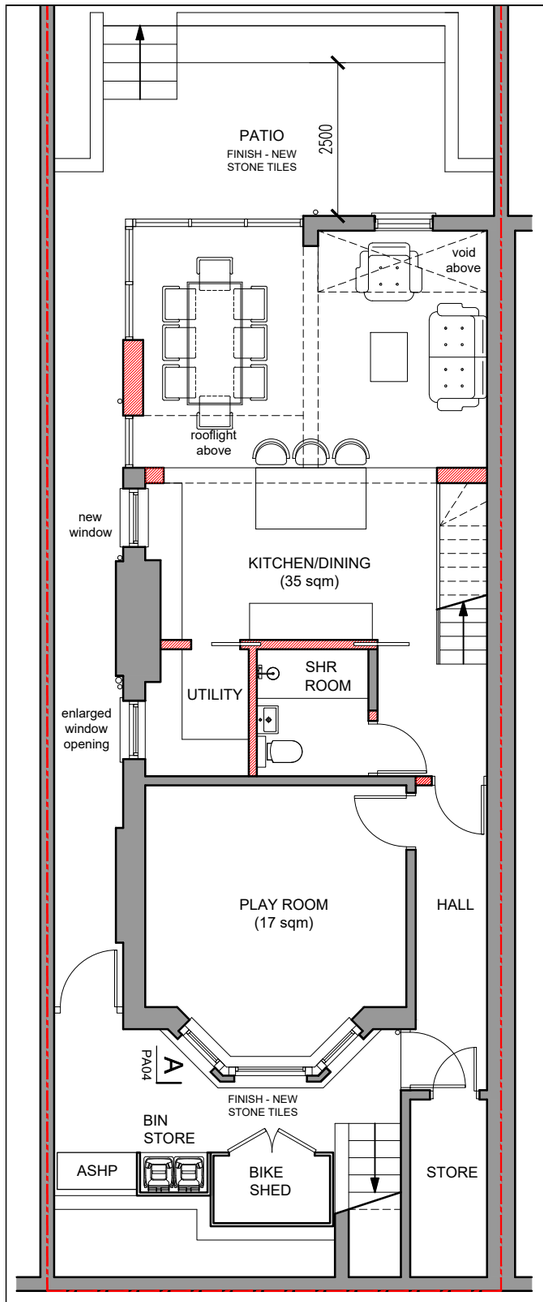
DRAWING TITLE
EXISTING FLOOR PLANS

DRAWING No (PL)02
SCALE 1:100@A3
DATE NOV'24

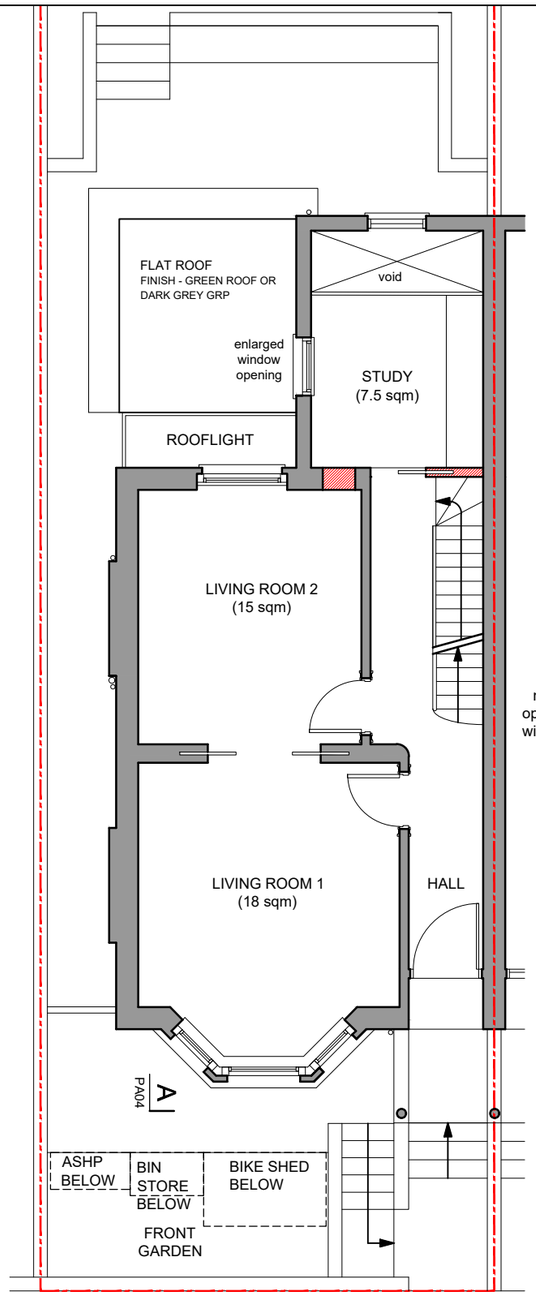
NOTES

0 5m 10m

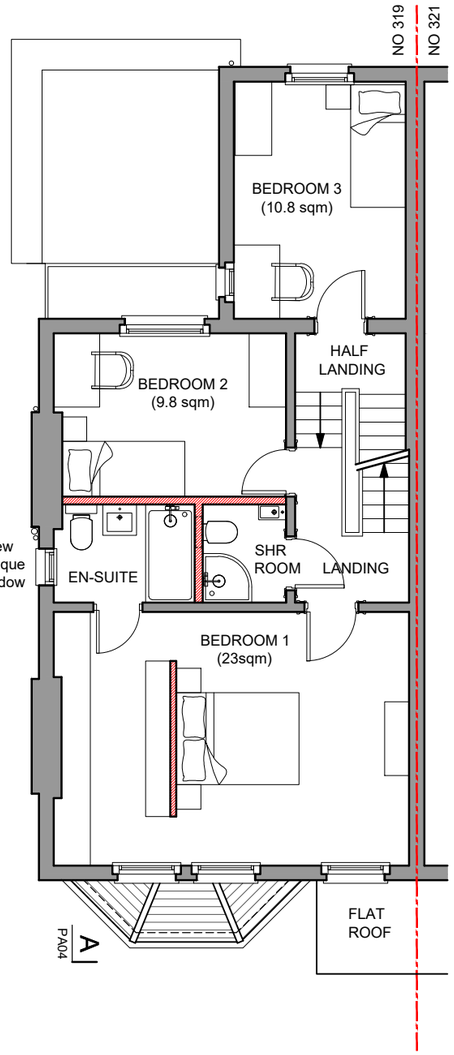
Appendix C - Proposed Floor Plans



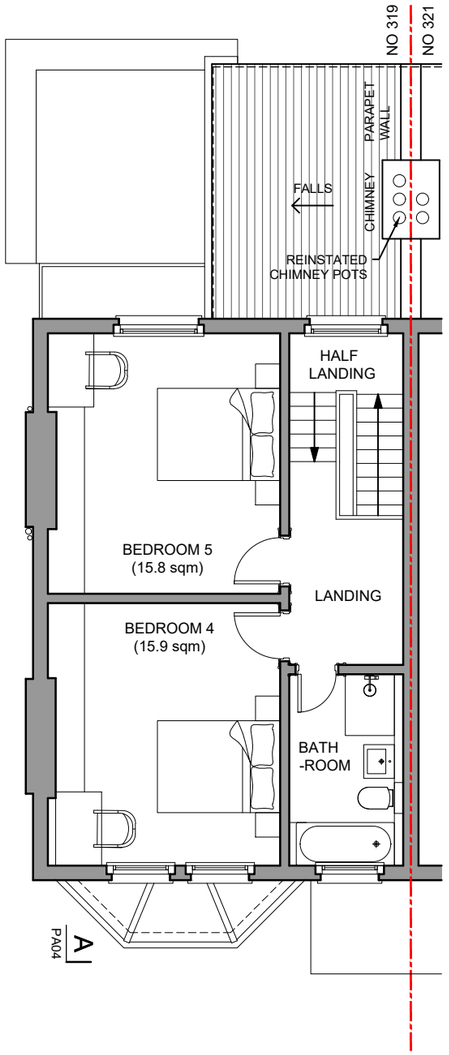
PROPOSED LOWER GROUND FLOOR



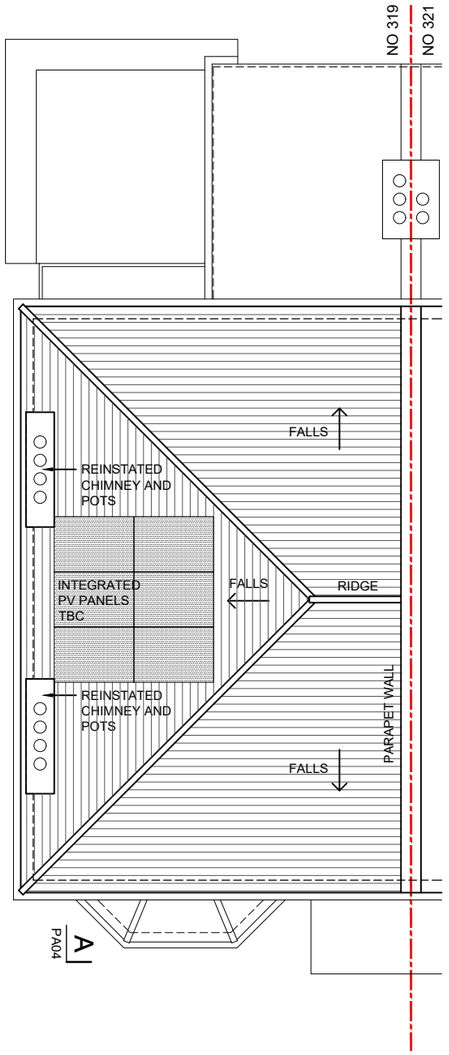
PROPOSED UPPER GROUND FLOOR



PROPOSED FIRST FLOOR



PROPOSED SECOND FLOOR



PROPOSED ROOF PLAN

REV DATE DESCRIPTION

ARCHITECTURE
HANNA KURNEL E: HANNAK@HOTMAIL.CO.UK M: 07795840020

PROJECT
PROPOSED CONVERSION FROM FLATS TO SINGLE HOUSE, SINGLE STOREY REAR EXTENSION, WINDOW REPLACEMENT AND SUNDRY ALTERATIONS
319 & 319A RICHMOND ROAD
TW1 2PB TWICKENHAM

DRAWING TITLE
PROPOSED FLOOR PLANS

DRAWING No (PL)02
SCALE 1:100@A3
DATE NOV'24

NOTES

0 5m 10m