PROPOSED CHANGE OF USE AT NUMBER 422 LEE HIGH ROAD, LEWISHAM, LONDON

FLOOD RISK ASSESSMENT

MARCH 2024

REF: 3347/RE/12-23/01 REVISION A

Evans Rivers and Coastal Ltd
T: 07896328220
E: Enquiries@evansriversandcoastal.co.uk
W: www.evansriversandcoastal.co.uk

CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Riverpine Estates to carry out a flood risk assessment for a proposed change of use at number 422 Lee High Road, Lewisham, London.

QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; depth analysis; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by providing specifications to third parties such as surveyors; initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

Report carried out by:

Rupert Evans, BSc (Hons), MSc, CEnv, C.WEM, MCIWEM, PIEMA

DISCLAIMER

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1. INTRODUCTION

1.1 Project Scope

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Riverpine Estates to carry out a flood risk assessment for a proposed change of use at number 422 Lee High Road, Lewisham, London.

1.1.2 Specifically, this assessment intends to:

a) Consider the impacts of the 1 in 30 year, 1 in 100 year and 1 in 1000 year flood events (inclusive of climate change), in accordance with NPPF;

b) Review any literature and guidance specific to this area;

c) Determine the extents of the aforementioned NPPF Flood Zones across the site, together with depths of floodwater and hazard;

d) Assess the risks to people and property and propose mitigation measures accordingly;

e) Review existing evacuation and warning procedures for the area;

f) Carry out an appraisal of flood risk from any other sources such as groundwater as required by NPPF;

g) Report findings and recommendations.

1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2023. Other documents which have been consulted include:

- DEFRA/EA document entitled *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*, 2005;
- Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- DEFRA/EA document entitled *The flood risks to people methodology (FD2321/TR1),* 2006;
- EA *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose*, 2008;
- National Planning Practice Guidance – Flood Risk and Coastal Change.
- UK Government's climate change allowances guidance.
- Environment Agency guidance entitled *Flood risk assessments: Climate change allowances – Kent and South London area.*
- London Borough of Lewisham Strategic Flood Risk Assessment (SFRA) dated 2015 and 2008.
- London Borough of Lewisham Strategic Flood Risk Assessment Level 1 (2018 SFRA) dated 2018.

- London Borough of Lewisham Surface Water Management Plan (SWMP) dated 2011.
- London Borough of Lewisham Preliminary Flood Risk Assessment (PFRA) dated 2011.
- London Borough of Lewisham Local Flood Risk Management Strategy (LFRMS) dated 2015.

2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map (Evans Rivers and Coastal Ltd OS licence number 100049458).
- Filtered LIDAR survey data at 1m resolution.
- British Geological Survey *Online Geology Viewer.*
- Product 6 flood level data provided by the Agency as GIS files. Taken from Ravensbourne 2015 model.
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).

3. SITE CHARACTERISTICS

3.1 Existing Site Characteristics and Location

3.1.1 The site is located at number 422 Lee High Road, Lewisham, London. The approximate Ordnance Survey (OS) grid reference for the site is 539810 174967 and the location of the site is shown on Figure 1.

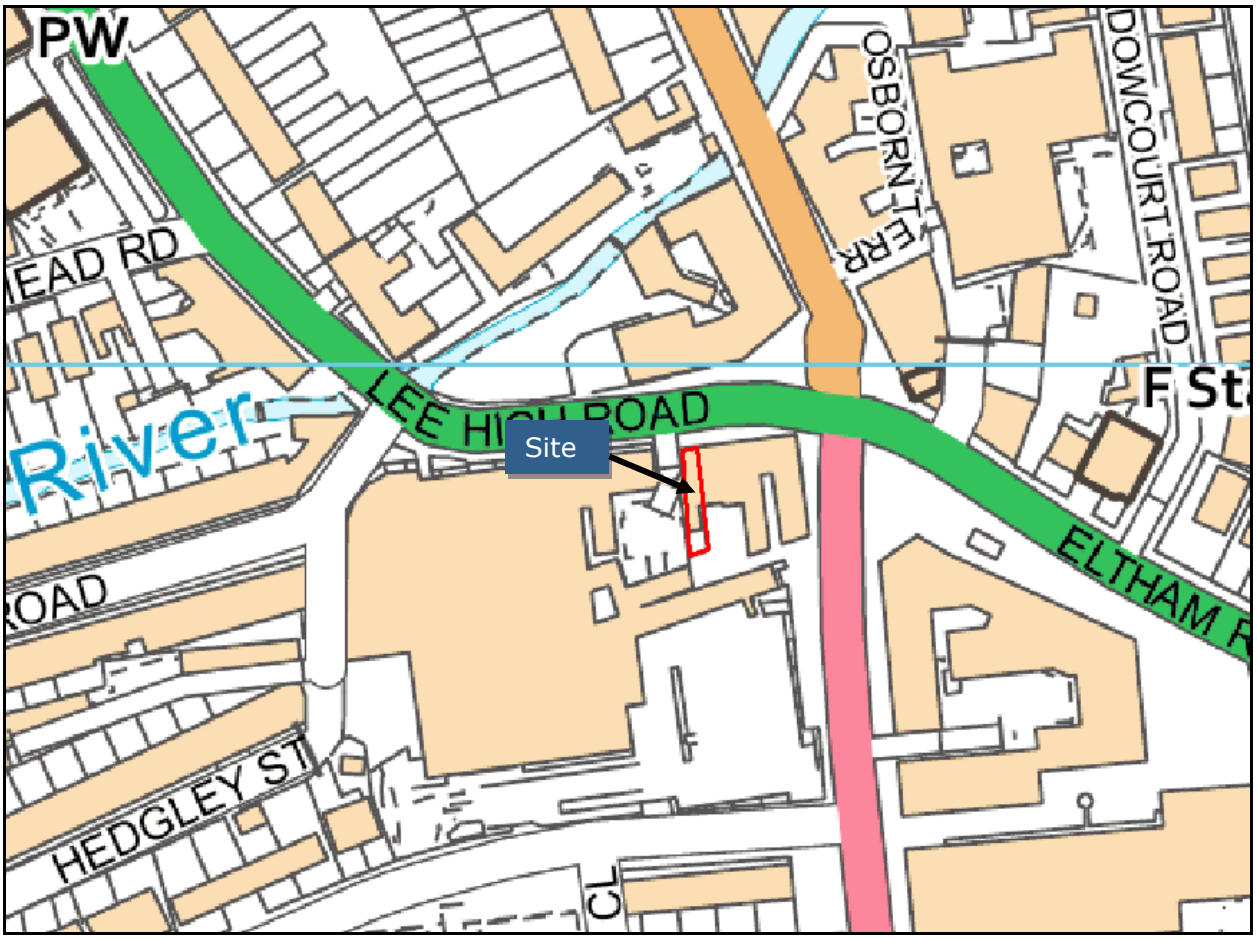


Figure 1: Site location plan (Source: Ordnance Survey)

3.1.2 The site comprises an existing ground floor area currently used for retail as shown on Drawing Number LHR.422.EX.01. The site is accessed from Lee High Road adjacent to the northern frontage of the site.

3.1.3 Filtered LIDAR data at 1m resolution has been obtained in order to determine and illustrate the topography across the site and surrounding area (Figure 2).

3.1.4 The survey data and on-site inspections indicates that the ground floor is set 100mm higher than existing ground levels and at 16.70m AOD.

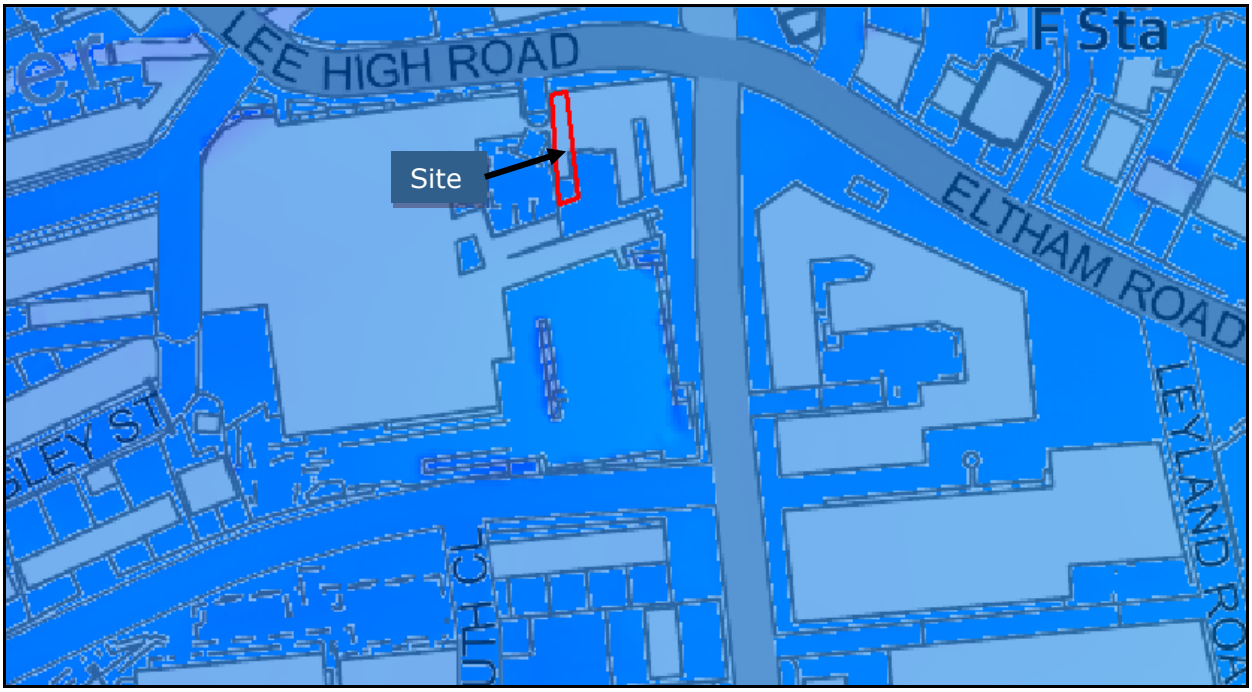


Figure 2: Filtered LIDAR survey data at 1m resolution where higher ground is denoted by red and orange colours and lower ground is denoted by blue colours

3.2 Site Proposals

3.2.1 It is the Client's intention to change the use of the ground floor to a studio flat. The proposed ground floor level will be set at 16.90m AOD which is >0.3m above the climate change 1 in 100 year flood level.

3.2.2 The proposed site layout can be seen on Drawing Number LHR.422.PR.01.

3.2.3 Annex 3 of the NPPF confirms that residential development is classified as a 'more-vulnerable' use.

3.2.4 Paragraph 14 and 27 of the NPPG and paragraph 168 of the NPPF states that the Sequential Test does not apply to change of use applications.

4. BASELINE INFORMATION

4.1 Environment Agency Flood Zone Map

4.1.1 The Environment Agency's Flood Zone Map (Figure 3) and Map 004 of the 2018 SFRA shows that the site is located within the NPPF defined Flood Zone 3a associated with the (part culverted) River Quaggy.

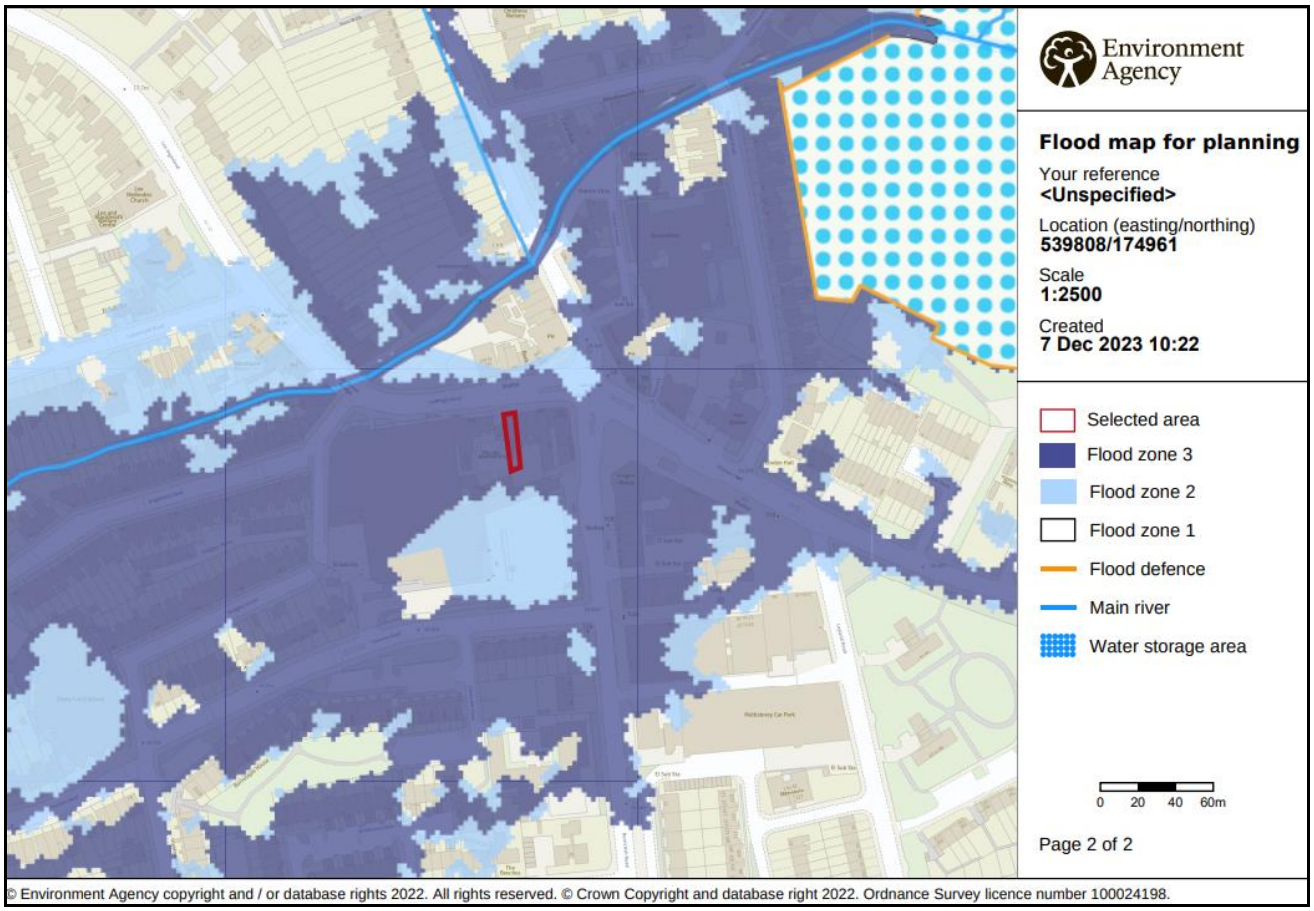


Figure 3: Environment Agency Flood Zone Map (Source: Environment Agency, 2023)

4.2 Flood Defences and Environment Agency Flood Levels

4.2.1 The Environment Agency information via https://environment.data.gov.uk/asset-management/index.html identifies that a flood defence wall runs along part of the River Quaggy at this location.

4.2.2 Product 6 flood level data has been provided by the Agency as 2D GIS files. The data has been taken from the Ravensbourne 2015 model and the 2D results relevant to the site's location can be seen in Table 1.

4.2.3 It is understood from the UK Government's climate change allowances guidance the "Central" climate change allowance should be used in FRA's. Therefore, for the London Management Catchment the climate change allowance is 17% up to year 2080s.

4.2.4 Therefore, as the Agency's updated climate change fluvial modelling includes a 25% climate change allowance, it is considered that this will give a conservative climate change estimate and closer to the Higher Central allowance of 27%.

Table 1: 2D Fluvial flood level data

1 in 30 year (mAOD)	1 in 100 year (mAOD)	1 in 100 year plus 25% climate change (mAOD)	1 in 1000 year (mAOD)
N/A	16.51	16.57	16.58

N/A: event modelled but floodwater doesn't reach the site

4.3 Flood Warning and Emergency Planning

4.3.1 The site is located within an Environment Agency Flood Warning Area 064FWF43QuagFAS - River Quaggy at Kidbrooke, Lee and Hither Green.

4.3.2 Sites at risk of fluvial flooding could have a minimum of 2 hours warning before any of the levels of flood warning is issued.

4.3.3 Flood Alerts, Flood Warnings and Severe Flood Warnings are issued to residents and businesses within flood risk areas by the Agency's *Floodline Warnings Direct* (FWD) service. This system is managed by the Environment Agency and dials out a message to the recipient when a particular category of flood warning is being advised. The message is conveyed by a constant ringing of the telephone or can alternatively be communicated to mobile phones and computers. The system functions at all times, issuing flood warnings and alerts in conjunction with announcements on radio and other media. Owners and occupiers of dwellings or businesses thought to be at risk can sign up to the scheme. **The owners are encouraged to confirm details with the Agency and to sign up for these warnings.** The various flood warning codes can be seen on Figure 4.

Figure 4: Flood warning codes (Source: Environment Agency)

4.3.4 It is understood that in the event of flooding, evacuation is managed by a multi-agency team in conjunction with the Police. The multi-agency team provides suitable premises for shelter, first aid, refreshments and possible transportation with consideration given to the elderly and vulnerable groups. It is essential that occupants produce robust Emergency Flood Plans to avoid putting themselves or emergency services at risk and that they do not rely solely on emergency services during the event.

5. FLUVIAL FLOOD RISK

5.1 Table 2 shows the flood depth and hazard across the site. In order to determine the flood hazard at the site the hazard categories outlined in Table 13.1 of *FD2320/TR2* (Figure 5 below), which is defined by the depth and velocity of the floodwater and the ability of people to evacuate once flooding occurs, has been used (assuming 0.5 m/s velocity). It should be noted that the white cells shown on Figure 5 denote a *Very low* hazard.

Table 13.1 Danger to people for different combinations of depth and velocity

Velocity (m/s)	Depth of flooding (m)											
	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.00												
0.10												
0.25												
0.50												
1.00												
1.50												
2.00												
2.50												
3.00												
3.50												
4.00												
4.50												
5.00												

Key:
- Danger for some
- Danger for most
- Danger for all

(Source Table 13.1 of FD2320/TR2)

Figure 5: Hazard Classification

Table 2: Flood levels, depths and hazard

	1 in 30 year	1 in 100 year	1 in 100 year plus 25% climate change	1 in 1000 year
	N/A	16.51m AOD	16.57m AOD	16.58m AOD
Flood Depth (m) across proposed ground floor level at 16.90m AOD.	N/A	0	0	0
	Very low hazard			
	Dangerous for Some			
	Dangerous for Most			
	Dangerous for All			

5.2 It can be seen in Table 2 that the proposed ground floor would be unaffected during all modelled events up to and including the worst-case 1 in 1000 year event.

5.3 GIS mapping has been provided by the Agency and can be seen on Figures 6 and 7.

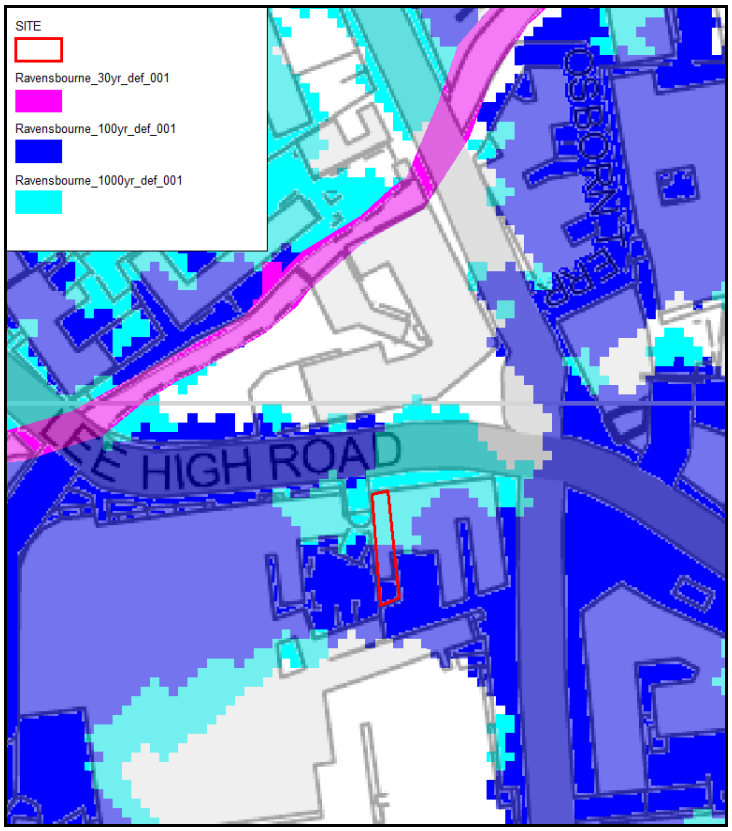


Figure 6: Present day flood extents

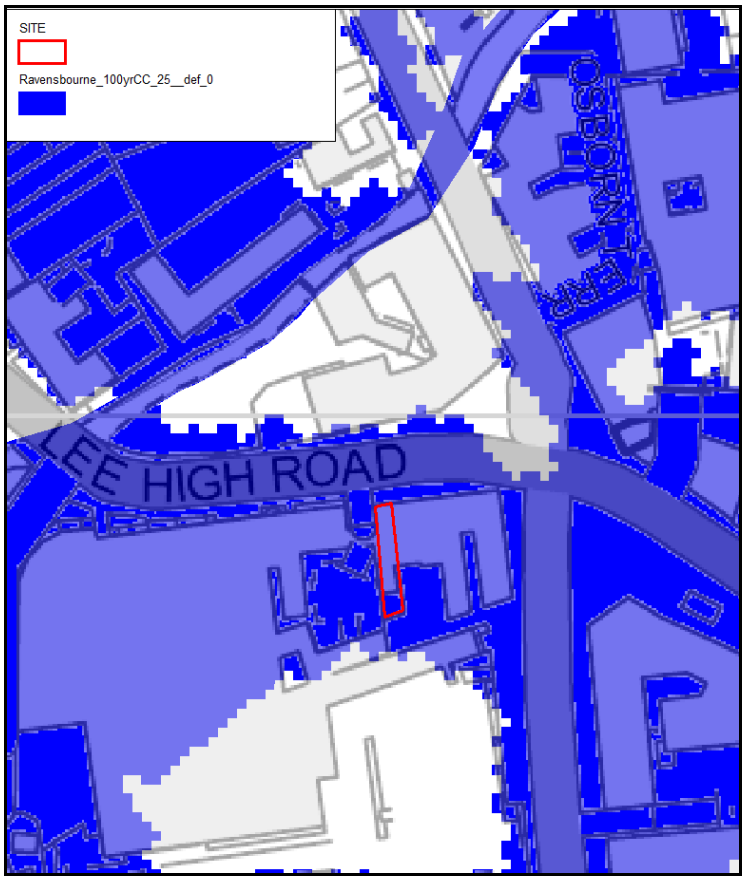


Figure 7: Climate change flood extents

6. FLOOD RISK MITIGATION AND EVACUATION

6.1 Reducing Exposure to the Hazard

6.1.1 In order to assess and reduce the exposure to the hazard and the vulnerability to the hazard after the site has been developed, the guidance outlined in the DCLG/DEFRA/EA document entitled *Flood Risk Assessment Guidance for New Development Phase 2*; *Flood Risks to People, Phase 2*; *Improving the Flood Performance of New Buildings* has been consulted.

6.1.2 Paragraph 004 of the NPPF Planning Practice Guidance states that the first preference is to avoid flood risk by raising floor levels above the design flood level.

6.1.3 The proposed ground floor level will be set at 16.90m AOD which is >0.3m above the climate change 1 in 100 year flood level and above all modelled flood levels. Therefore, safe refuge would be available at all times and the proposals comply with the NPPG.

6.2 Reducing Vulnerability to the Hazard

6.2.1 It is understood that the police and other emergency services will assist in the evacuation to rest centres operated by the Council. The Fire Service will assist in any rescuing of people from the flooded area once this has occurred.

6.2.2 It is recommended that the occupants liaise with the Agency in order to register with the Agency's Flood Warnings Direct service and ensure that they are aware of the flood risk so that they have the option to escape/evacuate upon receipt of a *Flood Warning* or upon the instruction of the emergency services.

6.2.3 The occupants should develop a *Family Flood Plan*. Further guidance is offered in the Environment Agency's guidance document entitled *What to do before, during and after a flood*. The *Family Flood Plan* should consider, for example, information about vital medication needed and a *Flood Kit*.

6.2.4 A *Flood Kit* is a useful precautionary measure especially if evacuation from the site is prolonged. The kit should be stored in an accessible location to ensure that it is not affected by floodwater. The contents should also be checked every 6 months and items replaced if necessary.

6.2.5 It may be sensible to compile two *Flood Kit's* to suit each eventuality. For example, a smaller kit could be compiled which would allow the occupants to carry it during evacuation. A larger kit could also be compiled which included additional food and beverage items in case of ongoing refuge within the property. Both kits should contain the necessary items as suggested below.

1. Important documents
2. Torch and batteries
3. Mobile phone (fully charged)
4. First-aid kit
5. Wind-up radio
6. Important telephone numbers
7. Bottled water
8. Non-perishable food provisions
9. Rubber Gloves and wellington boots
10. Medication or information relating to medication and its location
11. Blankets, warm clothes

12. Essential toiletries
13. Camera to record any damage
14. Emergency cash

Table 3: Flood Event Action Plan

Environment Agency Flood Warning Code	What to do!	Evacuate?
Flood Alert (Flooding Possible. Be aware/prepared! Watch Out).  	• Monitor flood risk through media and Floodline Warnings Direct. • Locate family members and inform them of risk. If away from the site make assessment on risk if considering returning to site (i.e. how long it will take to return etc). • Check flood kit, check occupants, check pets – BE PREPARED in case the situation gets worse.	Not necessary. Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you.
Flood Warning (Flooding of homes, businesses and main roads is expected. Act now!).  	• Maintain communication through Floodline Warnings Direct and the media. • Begin to implement Flood Plan. • Consider advice given from emergency services/Environment Agency. • Check insurance, Check flood kit, Check Pets. • Check alternative accommodation arrangements.	Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you. People who do not evacuate should reside across site. No formal evacuation or rest centre set-up will be undertaken at this warning level, however, if flooding is experienced across the area emergency services will rescue people.
Severe Flood Warning (Severe flooding is expected. Imminent danger to life and property. Act now!).	• Leave site immediately if not already done so. • Take flood kit, occupants and pets with you. • Follow advice given by Emergency Services and Council.	Leave site according to advice given by Emergency Services and Council. Take flood kit, occupants and pets with you. If evacuation cannot be

		undertaken, people should reside across site with *flood kit* and maintain communication with the emergency services.
Warnings no longer in force (No further flooding is expected in the area. Be careful).	• Return to site upon instruction from emergency services and assess any damage. • Contact insurance company depending on damage caused. • Do not touch sources of electricity. • Arrange for utilities to reconnect services.	Not applicable, however site may be uninhabitable. Return to site upon instruction from emergency services as floodwater may not have receded.

6.3 Vulnerable Groups

6.3.1 The occupants at the site may include vulnerable groups such as elderly people, those with sensory or physical disabilities, minority ethnic groups, or the infirm. Priority will need to be given to these people during the flood event.

6.3.2 Vulnerable groups should be identified by the occupants and priority should be given to these groups during the event.

6.4 Safe Access/Egress

6.4.1 The flood hazard is calculated based on different combinations of floodwater depth and velocity, and subsequently by using the hazard equation as cited in the DEFRA/EA R&D Document *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2).* The numerical hazard rating extracted from the model is then categorised into four degrees of flood hazard (Table 4) in accordance with Table 3.2 of *FD2321/TR1* and Table 4.2 of *FD2321/TR2.*

Table 4: Hazard to people categories (taken from Table 3.2 of *FD2321/TR1* and Table 4.2 of *FD2321/TR2)*

Hazard Rating	Degree of Flood Hazard	Description
< 0.75	Very low hazard	Caution "Flood zone with shallow flowing water or deep standing water"
0.75 – 1.25	Danger for Some	Dangerous for some (i.e. children) "Danger: Flood zone with deep or fast flowing water"
1.25 – 2.0	Danger for Most	Dangerous for most people (i.e. general public) "Danger: Flood zone with deep fast flowing water"
> 2.0	Danger for All	Dangerous for all "Extreme danger: flood zone with deep fast flowing water"

6.4.2 The hazard rating has been extracted from the Agency's hazard GIS data and therefore according to Table 4 above, the hazard to people during the climate change 1 in 100 year event would be *Very low* for 28m, *Dangerous for Some* for 45m then *Very low* thereafter.

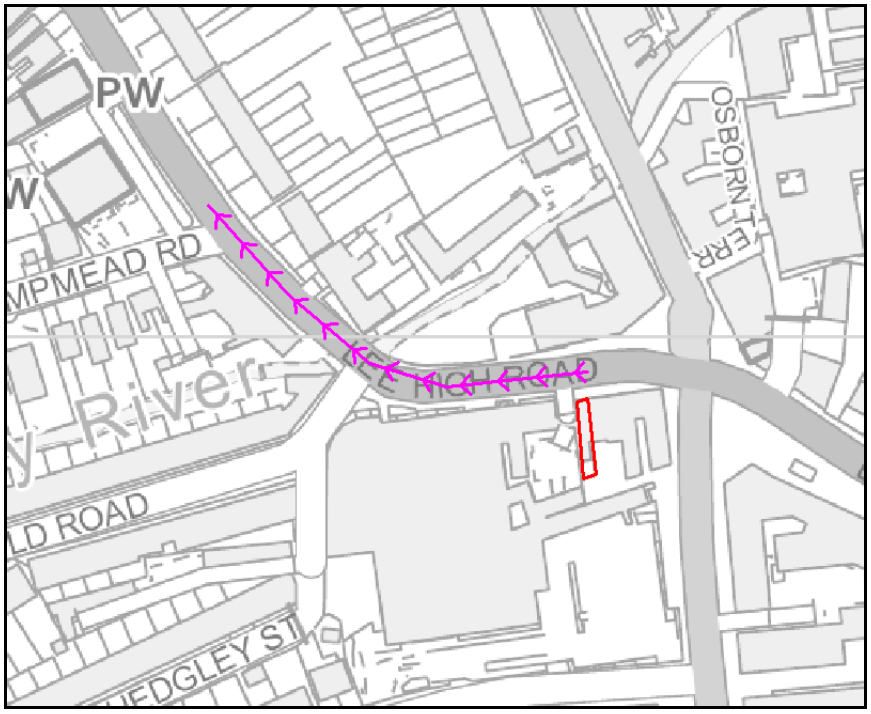


Figure 8: Preferred evacuation route

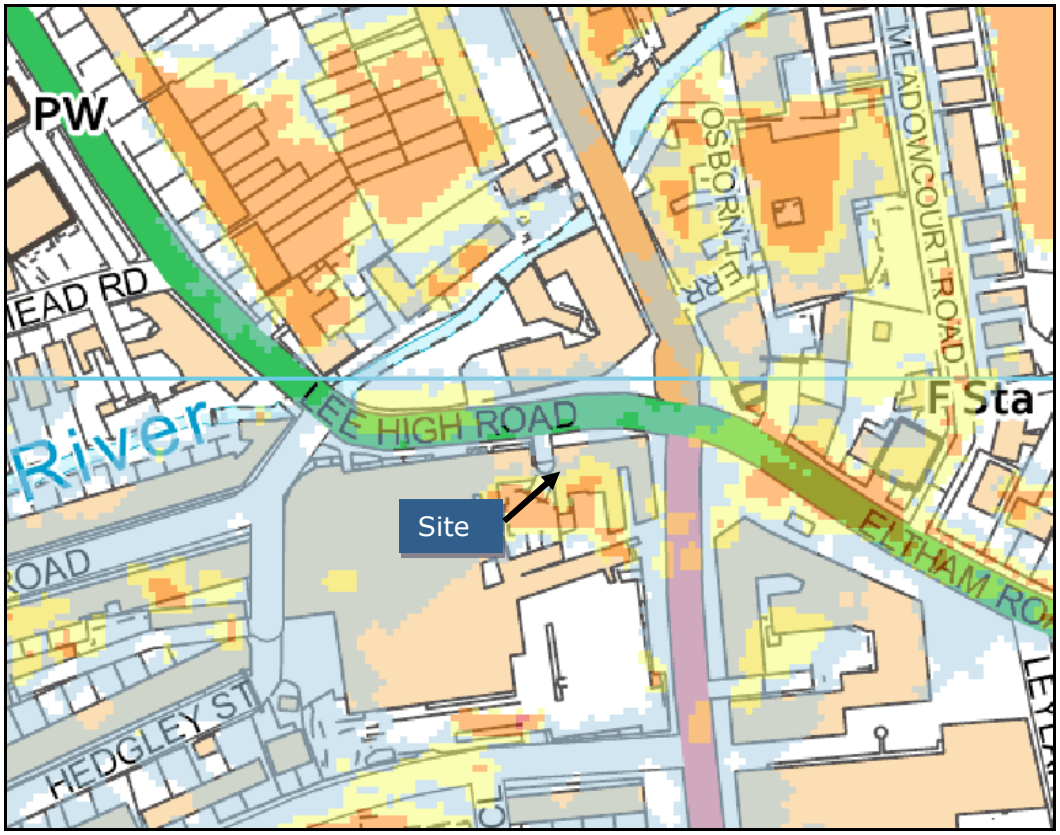


Figure 9: Hazard map for 100yrCC event (refer to Table 4 above for classification)

6.5 Insurance

6.5.1 The Association of British Insurers (ABI) published a guidance document in 2012 entitled *Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England*.

6.5.2 The ABI guidance sets out the requirements of the insurance industry when considering flood risk and insurability of the property. The guidance suggests that properties should be protected for flood events up to the climate change 1 in 100 year event in order to access insurance at a competitive price.

6.5.3 The guidance also states that insurers would of course prefer to cover properties which are not at risk of flooding, however, for those properties which are at risk of flooding insurers would prefer that the properties are raised above the flood level, over resistance measures which prevent floodwater from entering the building, or resilience measures which allows floodwater to enter the building.

6.5.4 The ground floor level is set above the climate change 1 in 100 year flood level and 1 in 1000 year flood level, therefore, the ABI's requirement of protection during a climate change 1 in 100 year event will be exceeded and there will be a good chance of the property being insured at a competitive rate.

7. OTHER SOURCES OF FLOODING

7.1 Groundwater Flooding

7.1.1 In order to assess the potential for groundwater flooding during higher return period rainfall events, the Jacobs/DEFRA report entitled *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study*, published in May 2004, was consulted, together with the guidance offered within the document entitled *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*, commissioned by DEFRA and carried out by Jacobs in 2006.

Soil and Geology at the Site

7.1.2 The British Geological Survey's *Online Geology of Britain Viewer* indicates that the soils beneath the site comprise sand and gravel.

Groundwater Flooding Potential at the Site

7.1.3 There have been no recorded groundwater flood events across the site between 2000 and 2003, as indicated by the Jacobs study.

7.1.4 Map 007 of the 2018 SFRA shows that there is potential for groundwater flooding to occur at the surface. However, the building footprint will confine the water table and prevent it from breaching the ground surface.

7.2 Surface Water Flooding and Sewer Flooding

7.2.1 Surface water and sewer flooding across urban areas is often a result of high intensity storm events which exceed the capacity of the sewers thus causing them to surcharge and flood. Poorly maintained sewer networks and blockages can also exacerbate the potential for sewer flooding.

7.2.2 Map 003b and 005 of the 2018 SFRA shows that there have been a small number of historical records of sewer or surface water flooding in this postcode area. Map 005 of the 2018 SFRA shows that the site is not located within an area with local critical drainage issues.

7.2.3 The Environment Agency's Surface Water Flooding Map (Figure 10 and 11) indicates that across the building there is a very low risk (i.e. less than 1 in 1000 year chance).

7.2.4 As the surface water flood maps do not include a scenario which considers climate change, the low risk/1000yr flood event is used as a substitute for the 100yrCC event to provide a worst-case scenario.

7.2.5 The ground floor is located across very low risk areas thus providing safe refuge and no internal flooding.

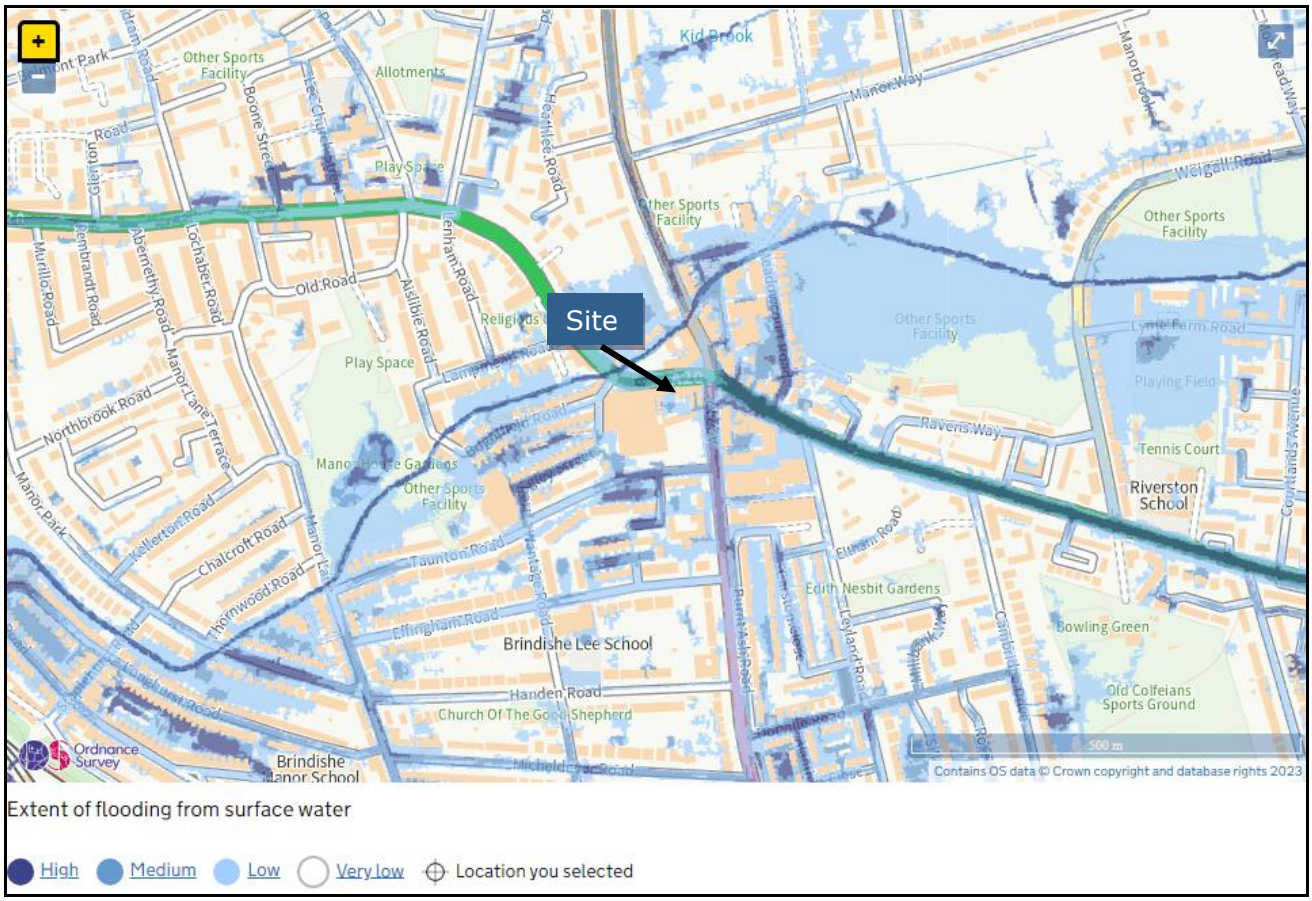


Figure 10: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2023)

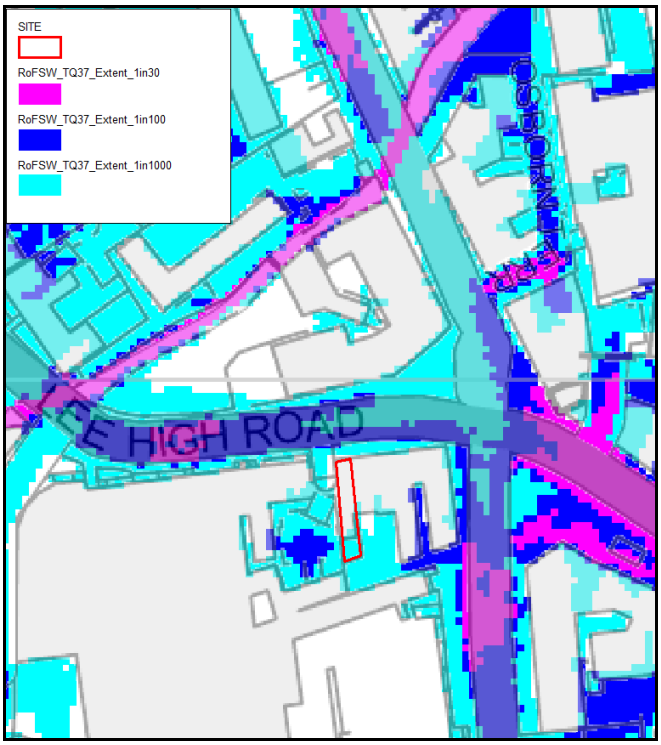


Figure 11: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2023)

Reducing Vulnerability to the Hazard

7.2.6 Flood Warnings for surface water flooding do not currently exist, however, the occupants should sign up to the Met Office weather warning system https://www.metoffice.gov.uk/public/weather/warnings and safe refuge is available at all times.

Table 5: Flood Event Action Plan

Alert	Level Definition	Action	Responsibility
Yellow: be aware	Yellow warnings can be issued for a range of weather situations. Many are issued when it is likely that the weather will cause some low level impacts, including some disruption to travel in a few places. Other yellow warnings are issued when the weather could bring much more severe impacts to many people but the certainty of those impacts occurring is much lower. It is important to read the content of yellow warnings to determine which weather situation is being covered by the yellow warning.	Monitor flood risk through media. Locate family members and inform them of risk. If away from the site make assessment on risk if considering returning to site (i.e. how long it will take to return etc). Check flood kit, check occupants, check pets – BE PREPARED in case the situation gets worse.	Occupants
Amber: be prepared	There is an increased likelihood of impacts from severe weather, which could potentially disrupt	Monitor weather through media and local observations.	Occupants

	your works plans. This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property.	Consider advice given from authorities including Council, Environment Agency and emergency services. Begin to implement Flood Plan. Check insurance, Check flood kit, Check Pets.	
Red: Take Action	Dangerous weather is expected and, if you haven't already done so, you should take action now to keep yourself and your works force safe from the impact of the severe weather. It is very likely that there will be a risk to life, with substantial disruption to travel, energy supplies and possibly widespread. You should avoid travelling, where possible, and follow the advice of the emergency services and local authorities.	Follow advice given by Emergency Services, Environment Agency and Council. Maintain communication through the media. Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you. People who do not evacuate should reside across building.	Occupants

Safe Access/Egress

7.2.7 The Agency's map shows that there is a low to high risk along Lee High Road adjacent to the site.

7.2.8 By reviewing the flood hazard GIS *shape file* downloaded from Data.gov.uk (https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw), together with Table 4 above, it can be seen that the hazard to people leaving the site during low risk events would be *Dangerous for Most* for 70m, *Dangerous for Some* for 68m then *Very low.*

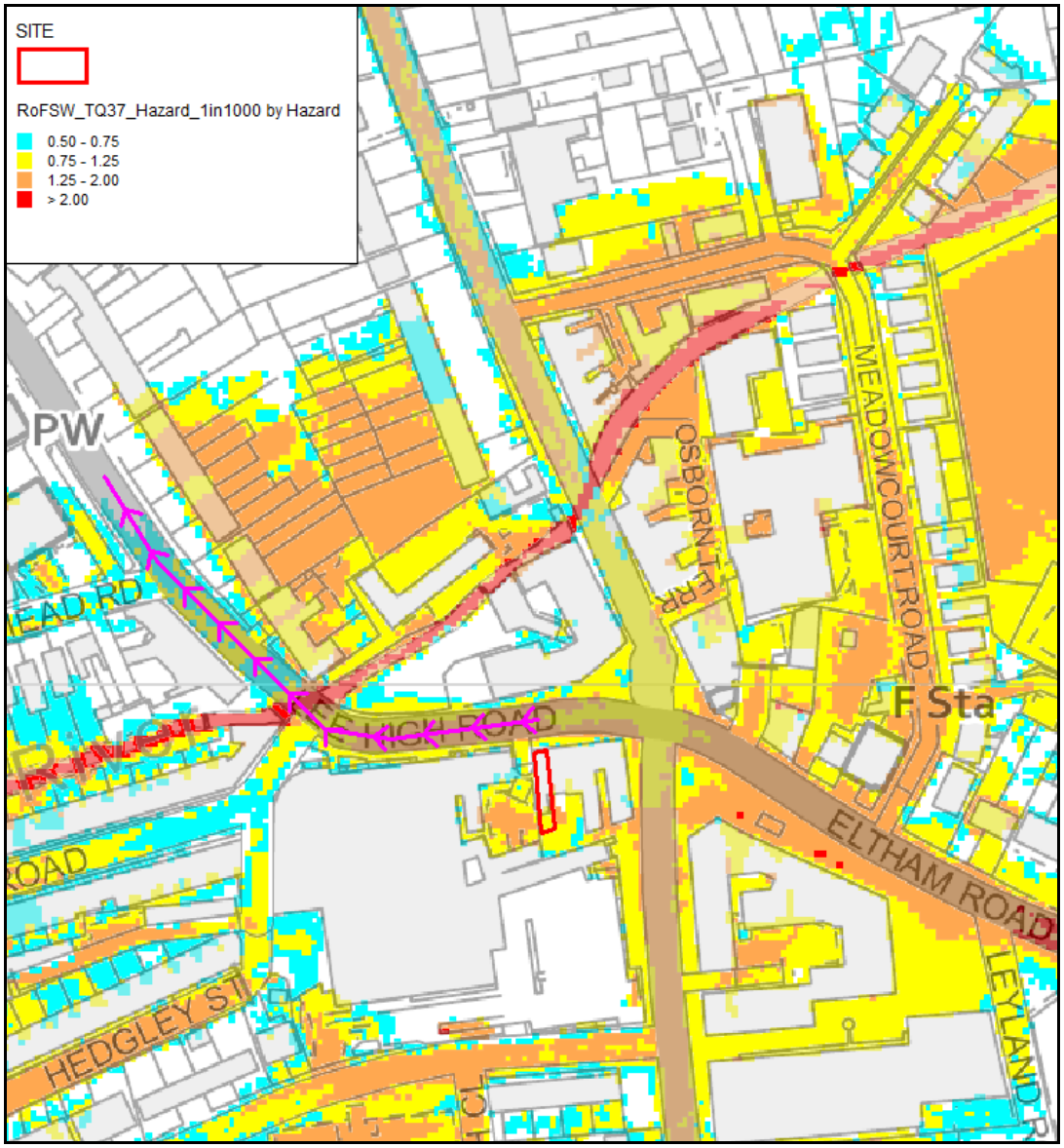


Figure 9: Flood hazard during low risk events (see Table 4 for hazard classification)

7.3 Reservoirs, Canals And Other Artificial Sources

7.3.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.

7.3.2 The Environment Agency's "Risk of flooding from reservoirs" map indicates that the site is at risk of flooding reservoirs.

7.3.3 However, as the information associated with the maps suggest, it is considered that reservoir flooding is extremely unlikely to happen and such features are regularly inspected by qualified engineers under the Reservoir Act 1975.

8. CONCLUSIONS

- The site is located within the NPPF defined Flood Zone 3a associated with (part culverted) River Quaggy.

- The design climate change (25%) 1 in 100 year flood level at the site has been estimated to reach 16.57m AOD. The extreme 1 in 1000 year flood level has been estimated to reach 16.58m AOD.

- The proposed ground floor level will be set at 16.90m AOD which is >0.3m above the climate change 1 in 100 year flood level and above all modelled flood levels, thus providing safe dry refuge and no internal flooding.

- A warning and evacuation strategy has been developed within this assessment. It is proposed that the occupants register with the Agency's *Flood Warnings Direct* and prepare a *Family Flood Plan*.

- It is considered that there is a low risk of groundwater flooding at the site from underlying deposits. There is a very low surface water flooding risk.

9. BIBLIOGRAPHY

i. Association of British Insurers 2012. *Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England.*

ii. CIRIA 2005. *Standards for the repair of buildings following flooding, Report 623.* CIRIA.

iii. CIRIA 2000. *Groundwater Control – design and practice, Report 515*. CIRIA.

iv. Cobby, D., et al. 2009. *Groundwater flood risk management: advances towards meeting the requirements of the EU Floods Directive.* Journal of Flood Risk Management.

v. Communities and Local Government 2018. *National Planning Policy Framework.*

vi. Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.

vii. DEFRA/EA 2007. *Public Response to Flood Warning, Flood and Coastal Defence R&D Programme, R&D Technical Report SC020116.* Environment Agency.

viii. DEFRA/EA 2006. *Flood Risks to People, Phase 2, R&D Technical Report FD2321/TR1, Flood and Coastal Defence R&D Programme*. Water Research Council.

ix. DEFRA/EA 2006a. *Flood Risks to People, Phase 2, R&D Technical Report FD2321/TR2, Flood and Coastal Defence R&D Programme*. Water Research Council.

x. DEFRA/EA 2005. *Framework and guidance for assessing and managing flood risk for new development, Phase 2, Flood and Coastal Defence R&D Programme, R&D Technical Report FD2320/TR2*. Water Research Council.

xi. DEFRA/EA 2005a. *Flood Warning for Vulnerable Groups: A review of the literature, Flood and Coastal Defence R&D Programme*. Environment Agency.

xii. DEFRA/Jacobs 2006. *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*.

xiii. DEFRA/Jacobs 2004. *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study (LDS), Final Report, Volumes 1 and 2*.

xiv. Dickie et al. 2010. *Planning for SUDS – Making it happen*. *Report C687*. London: CIRIA

xv. Environment Agency 2008. *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.*

xvi. Geological Society of London 2006. *Groundwater and Climate Change.* Geoscientist magazine, Volume 16, No 3.

xvii. Institute of Geological Sciences 1977. *Hydrogeological Map of England and Wales,* 1:625,000. NERC.

xviii. NERC 2009. *Flood Estimation Handbook* [CD-ROM], Version 3. Institute of Hydrology.

xix. NERC 1975. *Flood Studies Report (FSR)*. Institute of Hydrology.

xx. Newman, A.P. 2004. *Protecting groundwater with oil-retaining pervious pavements: historical perspectives, limitations and recent developments*. Quarterly Journal of Engineering Geology and Hydrogeology.

xxi. ODPM 2003. *Preparing for Floods*. London: ODPM.

xxii. Pratt, C., Wilson, S., and Cooper, P. 2002. *Source control using constructed pervious surfaces; hydraulic, structural and water quality performance issues, Report C582*. London: CIRIA.

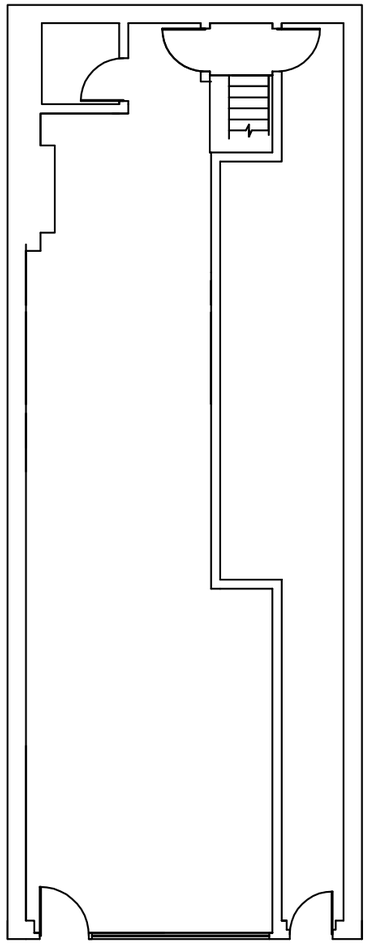
xxiii. Soil Survey of England and Wales 1983. *Soil Map of Eastern England (Sheet 4)*, 1:250,000. Cranfield University.

xxiv. UK Groundwater Forum. *Groundwater Resources and Climate Change.* http://www.groundwateruk.org/Groundwater_resources_climate_change.aspx [accessed 06/01/2016]

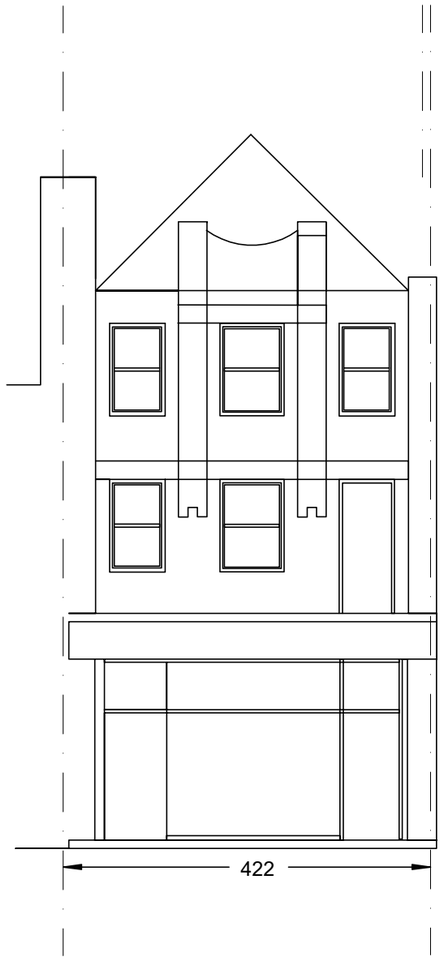
xxv. Woods-Ballard., et al. 2007. *The SUDS Manual, Report C697*. London: CIRIA.

DRAWINGS

EXISTING



Ground Floor



Front Elevation

METRES
0 5
SCALE

AJ PLANS
info@ajplans.co

NOTES
The contractors are to check all the dimensions, levels,drain runs and general condition of the site before works commence.

All works are to be carried out in accordance with current Building Regulations, British Standards, Code of Practice and Local Authority Requirements.

Project:
422 Lee High Road
London SE12 8RW

Title: EXISTING
Plans

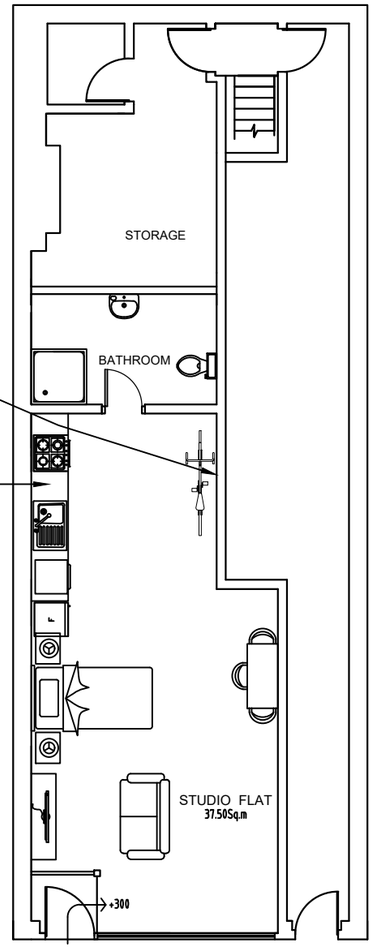
Date: 01.06.23.

Scale: 1:100 @ A3

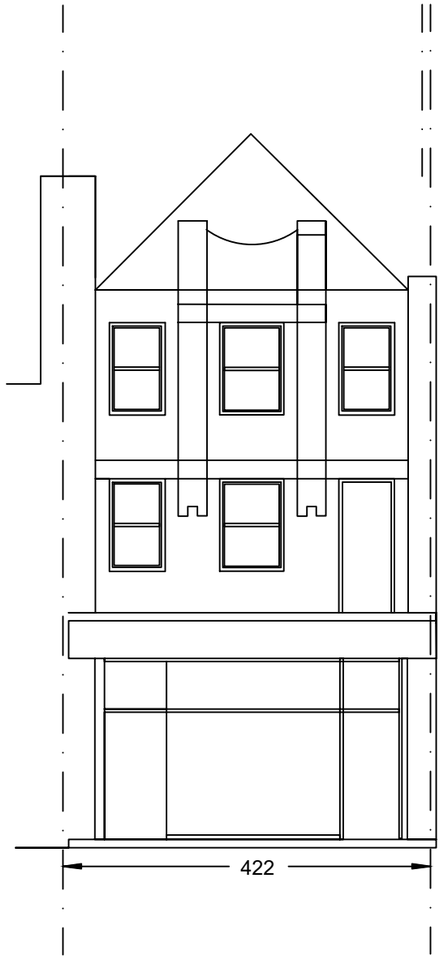
Dwg. No. LHR.422.EX.01

Rev:

PROPOSED

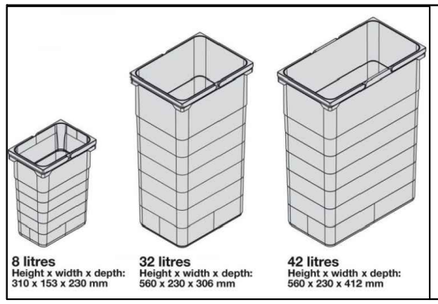


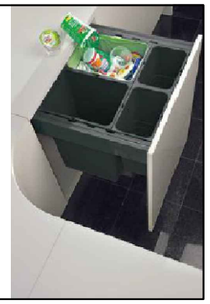
Ground Floor



Front Elevation

BESPOKE INTERNAL
SEALABLE BIN CUPBOARD





General waste & recycling sacks to be placed outside on collection day

METRES
0 5
SCALE

AJ PLANS
info@ajplans.co.uk

NOTES
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All works are to be carried out in accordance with current Building Regulations, British Standards, Code of Practice and Local Authority Requirements.

Project:
422 Lee High Road
London SE12 8RW

Title: PROPOSED Plans

Date: 14.06.23.

Scale: 1:100 @ A3

Dwg. No. LHR.422.PR.01

Rev: A


EVANS
Rivers and Coastal